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FLORA AUSTRALIENSIS.





# FLORA AUSTRALIENSIS:

A DESCRIPTION

OF THE

PLANTS OF THE AUSTRALIAN TERRITORY.

BY

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# CONSPECTUS OF THE ORDERS CONTAINED IN THE FIFTH VOLUME.

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## CLASS. I. DICOTYLEDONS.

### SUBCLASS II. MONOPETALÆ.

(Continued from Vol. IV.)

(*Ovary in the following Orders superior, usually 2-celled or the cells divided so as to be apparently 4-celled, with 1 pair of ovules or rarely 1 ovule or 2 superposed pairs of ovules to each true cell.*)

XC. MYOPORINÆ. Shrubs. Leaves alternate. Stamens usually 4, in pairs anthers when open reniform and 1-celled by confluence. Ovary not lobed, the style terminal. Micropyle and radicle superior.

XCI. SELAGINÆ. Herbs or small undershrubs. Leaves alternate or the lower ones opposite. Stamens usually 4, in pairs; anthers straight, 1-celled. Ovary not lobed, the style terminal. Micropyle and radicle superior.

XCII. VERBENACEÆ. Herbs shrubs or trees. Leaves opposite or rarely alternate. Stamens 2 or 4, in pairs, or rarely equal and isomerous with the corolla-lobes; anthers 2-celled. Ovary not at all or scarcely lobed, the style terminal. Micropyle and radicle inferior.

XCIII. LABIATÆ. Herbs or shrubs. Leaves opposite. Stamens 2 or 4, in pairs; anthers 2-celled or 1-celled by abortion or by confluence. Ovary deeply lobed, the style nearly basal between the lobes. Micropyle and radicle inferior.

XCIV. PLANTAGINÆ. Herbs. Leaves radical or tufted, rarely scattered. Flowers regular, the corolla with 4 spreading scarious lobes. Stamens 4 or fewer, equal; anthers 2-celled. Ovary not lobed, with a terminal style. *Seeds peltate.*

### SUBCLASS III. MONOCHLAMYDEÆ.

Perianth really or apparently simple, the lobes or segments all calycine or herbaceous, or all petal-like or scarious, or entirely wanting (rarely petals or petal-like staminodia in a few *Euphorbiaceæ* or *Phytolaccaceæ*).

\* *Ovary (except in Nyctaginæ?) formed of several carpels, but 1-celled and usually 1-ovulate (except in a very few Phytolaccaceæ and Amarantaceæ). Embryo excentrical or curved; albumen mealy, rarely wanting (Curvembryæ).*

XCV. PHYTOLACCACEÆ. Herbs undershrubs or rarely shrubs. Leaves alternate, without stipules. Ovules 1 to each carpel.

XCVI. CHENOPODIACEÆ. Herbs or undershrubs, often succulent or scaly-tomentose. Leaves alternate or rarely opposite, without stipules. Perianth usually herbaceous. Ovary (of 2 or 3 carpels) 1-celled, with 2 or 3 styles or style-branches and only 1 ovule.

XCVII. AMARANTACEÆ. Herbs or undershrubs, rarely shrubs. Leaves alternate or

opposite, without stipules. Perianth usually more or less scarious or coloured. Ovary (of 2 or 3 carpels) 1-celled, with 2 or 3 styles or style-branches and only 1 ovule or rarely a cluster of ovules, bearing no relation in number to that of the carpels.

XCVIII. PARONYCHIACEÆ. Herbs with the character of *Amarantaceæ*, except that the leaves (usually opposite) are accompanied by small scarious stipules or connected by a raised line or narrow membrane.

XCIX. POLYGONACEÆ. Herbs or shrubs. Leaves alternate; stipules usually thin or scarious, forming a sheath or ring round the stem. Ovary (of 2 or 3 carpels) 1-celled, with 2 or 3 styles or style-branches and only 1 ovule.

C. NYCTAGINEÆ. Herbs shrubs or trees. Leaves usually opposite, without stipules. Lower portion of the perianth persistent and enclosing the ovary and fruit, the upper portion deciduous or withering. Ovary 1-celled with 1 ovule and an undivided style.

*\*\* Ovary apocarpous or more frequently reduced to a single more or less oblique carpel, 1-celled with a single one or a pair of ovules and a single excentrical or oblique style or stigma. Embryo small or amygdaloid; albumen fleshy or none.*

CI. MYRISTICÆ. Trees. Leaves alternate. Flowers dioecious. Perianth-lobes i-seriate valvate. Stamens united in a central column. Carpel 1. Embryo very small at the base of a ruminant albumen.

CII. MONIMIACEÆ. Trees or shrubs. Leaves opposite. Perianth-lobes in 2 or more rows. Stamens opposite the perianth lobes or indefinite. Carpels usually several. Embryo very small in a fleshy albumen.

CIII. LAURINEÆ. Trees or shrubs with alternate or rarely opposite leaves or (in *Cassytha*) leafless parasitical twiners. Perianth-segments usually in 2 rows. Stamens opposite the perianth-segments; *anther-cells opening in deciduous valves*. Carpel 1. Fruit succulent. Albumen none. Radicle superior.

CIV. PROTEACEÆ. Trees or shrubs, rarely undershrubs. Leaves alternate or rarely opposite. Perianth-segments 4, valvate. Stamens opposite the perianth-segments and inserted on them. Carpel 1. Albumen none. Radicle inferior.

## FLORA AUSTRALIENSIS.

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### ORDER XC. MYOPORINEÆ.

Flowers irregular or rarely nearly regular. Calyx persistent, more or less deeply toothed or divided into 5, rarely 4, lobes or segments. Corolla with 4 or 5, rarely more, lobes more or less 2-lipped or nearly equal, imbricate in the bud, the upper lip or lobes outside (or rarely inside?). Stamens usually 4, in pairs, inserted in the tube of the corolla and alternating with its lower lobes, rarely nearly equal and as many as corolla-lobes; anther-cells opening longitudinally, at first nearly parallel, confluent at the apex, and usually when open forming a single reniform cell. Ovary free, not lobed, normally 2-celled, with 2 collateral ovules, or 2 or 3 superposed pairs of collateral ovules in each cell, attached to the incurved margins of a placenta projecting from the dissepiment so as to divide each cell more or less perfectly into 2, with one of the ovules of each pair in each half-cell, or sometimes the ovary divided from the first into 2 to 4, or in extra-Australian species more, cells with one ovule in each cell. Ovules pendulous, anatropous, with a superior micropyle. Style simple, undivided, or obscurely notched at the apex. Fruit a dry or succulent drupe, the endocarp 2- to 4- or rarely more-celled or 1-celled by abortion, or separating into as many pyrenes. Seeds usually solitary in each cell or half-cell, very rarely 2 or 3 superposed, albuminous in the species where they have been seen ripe, but the albumen sometimes thin; embryo straight, with a superior radicle.—Shrubs or rarely trees. Leaves alternate, scattered, or rarely strictly opposite, undivided. Flowers axillary, solitary, or in clusters of 2, 3, or more. Bracts at the base of the pedicels very small or none, no bracteoles on the pedicels.

The Order is chiefly Australian, and two genera entirely so; a third extends sparingly over the Indian Archipelago, the Pacific Islands, and tropical Africa; and there is a fourth monotypic tropical American genus. The affinity of this Order with Verbenacæ is so striking that some have proposed uniting the two, but the superior radicle has, on examination, proved so constant a distinction, that I have followed Brown and others in maintaining the two as separate Orders. The three genera, very distinct as to the majority of their species, run so much into one another, through intermediate species with the characters differently combined, that it is impossible to ascribe to them any absolute limits.

Corolla usually campanulate, nearly regular, rarely shortly cylindrical at the base. Ovary usually 2- to 4- or more celled, with 1 ovule in each cell, rarely 2-celled with 2 ovules in each cell.

Corolla usually tubular at the base, with a more or less irregular limb. Ovary 2-celled, with 2 or rarely 1 ovule in each cell.

Corolla usually tubular at the base, with a more or less irregular limb. Ovary 2-celled, with 2 or 3 superposed pairs, or rarely 1 pair only of ovules in each cell.

1. MYOPORUM.

2. PHOLIDIA.

3. EREMOPHILA.

## 1. MYOPORUM, Banks and Soland.

(Polycœlium and Disoon, DC.)

Calyx divided to the middle or nearly to the base into 5 lobes or segments not enlarged after flowering. Corolla-tube usually short and almost campanulate or shortly cylindrical at the base, lobes 5, nearly equal and regular, or the lowest rather larger. Stamens 4, alternating with the lower lobes, or rarely 5, all nearly equal, and scarcely protruding or shortly exerted. Ovary 2- to 4-celled, or in species not Australian 5- or 6-celled, with 1 ovule in each cell, or rarely 2-celled with 2 ovules in each cell. Drupe usually small, but more or less succulent.—Shrubs (or undershrubs?). Leaves alternate or rarely opposite, entire or toothed. Pedicels axillary, usually clustered. Flowers small, mostly white.

The genus is represented by a few species in the Indian Archipelago and the Pacific islands, and by one species in tropical Africa. Of the thirteen Australian species here enumerated, one may be the same as a New Caledonian one, the others appear to be all endemic.

SECT. I. *Eumyoporum*.—Calyx small, narrow. Ovary 2- to 4-celled, with 1 ovule in each cell. Fruit globular or ovoid, not compressed.

Erect or divaricate shrubs. Leaves from lanceolate to obovate.

Corolla more or less bearded inside, or rarely quite glabrous. Perfect stamens 4.

Leaves acute or acuminate, entire or very rarely slightly serrate. Corolla-lobes usually shorter than the tube.

Leaves obtuse, acute, or acuminate, some usually serrate. Corolla-lobes usually as long as the tube. (Southern or Western seacoast or salt plant).

Erect shrubs. Leaves lanceolate or linear, entire. Corolla not bearded at the throat. Stamens, 5.

Corolla 2 to 3 lines long.

Corolla 4 to 5 lines long.

Diffuse or procumbent shrubs. Leaves linear or cuneate, thick. Corolla-lobes bearded at the base, as long as the tube, or nearly so. Fruit globular.

Corolla-lobes glabrous, much shorter than the tube. Fruit ovoid.

Diffuse or weak shrub. Leaves opposite.

1. *M. acuminatum*.2. *M. serratum*.3. *M. deserti*.4. *M. laxiflorum*.5. *M. parvifolium*.6. *M. brevipes*.7. *M. oppositifolium*.

SECT. II. *Disoon*.—Calyx small, narrow. Ovary 2-celled, with 1 ovule in each cell. Fruit compressed.

Leaves very flat, acute (about 3 lines long).

Leaves linear-lanceolate, acute, entire or scarcely toothed,  $1\frac{1}{2}$  to 3 in. long.

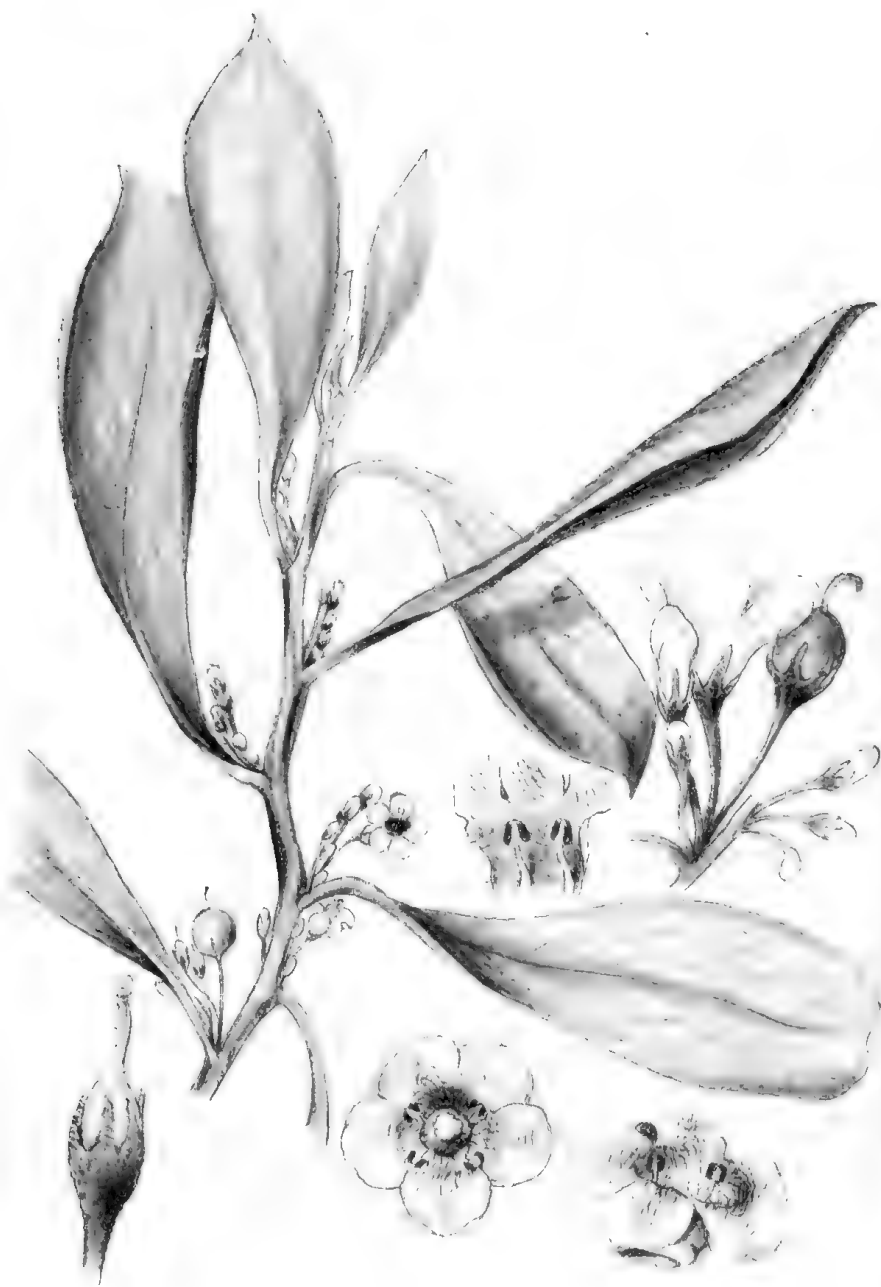
8. *M. platycarpum*.











*... ..*

- Leaves oblong or lanceolate, obtuse, serrate,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long.  
 Plant very glutinous . . . . . 9. *M. Beckeri*.  
 Fruit small and very obtuse, somewhat flattened (about 1 line long).  
 Leaves narrow, linear, 2 to 4 in. long . . . . . 10. *M. floribundum*.  
 Leaves minute, crowded, cordate . . . . . 11. *M. salsoloides*.  
 SECT. III. **Chamæpogonia**.—*Calyx-segments herbaceous*. Ovary 2-celled, with 2 ovules in each cell. Fruit somewhat compressed.  
 Calyx-segments 2 to 4 lines long. . . . . 12. *M. debile*.  
*Species insufficiently known.*  
 Calyx and foliage of some forms of *M. serratum*, but ovary and fruit said to be 2-celled, with 2 ovules or seeds in each cell . . . . . 13. *M. mucronulatum*.

SECT. I. EUMYOPORUM.—Calyx small, narrow. Ovary 2- 3- or 4-celled, with 1 ovule in each cell. Fruit globular or ovoid, not compressed.

The first six species of this Section, however different in extreme cases, run so much into each other that they might almost be reduced to varieties of a single one.

1. ***M. acuminatum***, *R. Br. Prod.* 515. An erect glabrous shrub, exceedingly variable in stature, breadth of leaves, and size of flowers. Leaves alternate, in the common forms varying from elliptical-oblong to lanceolate or linear, more or less acuminate, much contracted towards the base, quite entire, and  $1\frac{1}{2}$  to 3 in. long, but sometimes the broader ones almost obovate and rather obtuse, or all smaller, or very rarely a few of the leaves marked here and there with a few distant teeth. Pedicels 2 to 4 lines long, in axillary clusters of 2 to 4 or rather more, or rarely solitary. Calyx-tube very short, segments narrow, acute, rather rigid, rarely above 1 line long. Corolla almost campanulate, about 3 to 4 lines long, the lobes nearly equal, spreading, rather shorter, or sometimes much shorter than the tube, more or less bearded inside as well as the tube, the hairs sometimes almost disappearing from the lobes, but on a close examination I have very rarely found them quite absent as in *M. deserti*. Stamens 4 without any rudiment of the fifth in the numerous flowers examined, although such a rudiment has been observed by others; anthers very shortly protruding. Ovary most frequently 4-celled, but occasionally with only 3 cells and ovules. Drupe nearly globular, 2 to 3 lines diameter, or rarely larger.

**N. Australia.** Dampier's Archipelago and Cygnet Bay, N.W. coast, *A. Cunningham*; Nichol Bay, N.W. coast, *Ridley's Expedition*.

**Queensland.** Common along the coast from Cape Upstart, *M'Gillivray*, to Moreton Bay, *A. Cunningham* and others.

**N.S. Wales.** Very common from Port Jackson to the northern frontier and in the desert interior to the Murray and the Barrier range.

**Victoria.** On the Murray and adjoining deserts, but apparently replaced on the south coast by *M. serratum*.

**W. Australia.** Murchison river, *Oldfield*, *Drummond*, 6th coll. n. 137.

This truly polymorphous species, usually distinguished from *M. serratum* by its acute or acuminate entire leaves, cannot, however, be separated from it by any positive characters; and on the other hand has been subdivided into several races, or supposed species, of which the following are the most marked:—

1. *ellipticum*. Leaves rather broad and scarcely acuminate. Flowers moderate-

sized.—*M. ellipticum*, R. Br. Prod. 515; A. DC. Prod. xi. 707.—About Port Jackson, *R. Brown*, *Sieber*, n. 223, and others.

2. *acuminatum*. Leaves rather broad, acuminate, mostly 3 to 4 in. long. Flowers larger than in *M. ellipticum*.—*M. acuminatum*, R. Br. Prod. 515; A. DC. Prod. xi. 707.—Barnard and Frankland islands, *M'Gillivray*; Brisbane river, Moreton Bay, *F. Mueller* and others; Port Jackson, *R. Brown*, *Sieber*, n. 222 and others; Hastings river, *Beckler*. *Pogonia glabra*, Andr. Bot. Rep. t. 283; *Andreusia glabra*, Vent. Jard. Malm. t. 108, although figured with 5 equal stamens, is probably this form.

3. *parviflorum*. Leaves of the typical form, or rather smaller and narrow. Flowers smaller, the beard of the corolla copious or rare, or sometimes none at all.—*M. tenuifolium*, R. Br. Prod. 515; A. DC. Prod. xi. 711, au Forst.?—Queensland coast, Keppel and Shoalwater Bays, etc. *R. Brown*; islands off the coast, *M'Gillivray*, *F. Mueller*, and others; Rockingham Bay and Rockhampton, *Dallachy* and others; Moreton Bay and other parts of the coast, *A. Cunningham*. Some of the N.W. specimens appear also to belong to this form.

4. *angustifolium*. Leaves narrow-lanceolate or almost linear, but on longer petioles and more acute than in *M. deserti*, the lobes of the corolla sometimes almost, or even quite, glabrous, but often much bearded, and the upper stamen wanting (or small and abortive?)—*M. montanum*, R. Br. Prod. 515; A. DC. Prod. xi. 708; *M. Cunninghamii*, Benth. in Huet. Enum. 78; A. DC. l. c. 707; *M. cyanantherum* and *M. Dampieri*, A. Cunn. in A. DC. l. c. 708.—Port Jackson and Mount Hunter, *R. Brown*, but chiefly in the interior of Queensland and N. S. Wales, extending to the Murray, the Barrier Range, and to Cooper's Creek. To this form also belong most of the specimens from the N. W. coast as well as those from Murchison river.

The species is closely allied to, and perhaps should include, the New Caledonian *M. tenuifolium*, Forst., a name which in that case would claim the priority over Brown's. But on examining our New Caledonian specimens (Viellard n. 1091 and Deplanche n. 356), I find that, although they resemble some Queensland ones of the var. *parviflorum* yet the corolla is more perfectly glabrous inside, and the fifth stamen is present, although with a narrow barren anther. I have great doubts, however, whether this character will prove constant.

2. *M. serratum*, R. Br. Prod. 516. An erect or somewhat diffuse shrub, attaining several feet and usually glabrous, still more variable in foliage and flowers than *M. acuminatum*, and sometimes very difficult to distinguish from that species, whilst some of the forms enumerated below may be thought by many to be specifically distinct. Generally speaking the leaves are elliptical-oblong or lanceolate, obtuse or acute, and more or less serrate, but in a few maritime specimens they are all or nearly all entire, cuneate-oblong and obtuse. Flowers usually smaller than in *M. acuminatum*, and several in each axil, but sometimes quite as large as in that species. Calyx-lobes or segments varying from lanceolate and under  $\frac{1}{4}$  line long, to subulate and  $1\frac{1}{2}$  lines. Corolla-lobes usually as long as the tube, abundantly or sparingly bearded inside, at least at the base. Stamens 4, not exceeding the corolla-lobes, and sometimes scarcely protruding from the tube. Ovary-cells 2 to 4, but more frequently 3 than 2 or 4, with 1 ovule in each cell. Fruit globular or ovoid, not compressed, from 1 to 2 lines diameter, or even larger, but all the large ones appear to be deformed by the puncture of some insect.—A. DC. Prod. xi. 709; Bartl. in Pl. Preiss. i. 350; *M. insulare*, R. Br. Prod. 516; A. DC. l. c. 708; Bartl. in Pl. Preiss. i. 349; *M. tasmanicum*, A. DC. Prod. x. 709; Hook. f. Fl. Tasm. i. 287.

**N. S. Wales.** Apparently rare and only towards the Victorian frontier.

**Victoria.** Along the whole coast from Gipps Land to the Glenelg, *F. Mueller* and many others; Wimmera, *Dallachy*.

**Tasmania.** Kent's group, *R. Brown*; common along the N. coast, *J. D. Hooker*.

**S. Australia.** Spencer's gulf and other parts of the coast, *R. Brown* and others.

**W. Australia.** From the Great Bight, *Maxwell*, and King George's Sound, *R. Brown* and many others, to Murchison River, *Oldfield*, *Drummond*; Dirk Hartog's Island, *A. Cunningham*, *Milne*, and the Abrolhos, *Bynoe*.

The principal forms are the following:—

1. *obovatum*. Leaves obovate, oblong, rather broad, obtuse. Ovary very frequently 2-celled only, as figured Bot. Reg. 1845, t. 15.—*M. adscendens*, R. Br. Prod. 516. A. DC. Prod. xi. 710.—Chiefly in Tasmania and the sea-coast of Victoria, S. Australia, and King George's Sound.

2. *apiculatum*. Leaves linear-cuneate,  $\frac{1}{2}$  to 1 in. long, obtuse or mucronate, thick and often entire.—*M. apiculatum*, A. DC. Prod. xi. 707.—Station uncertain, probably W. coast, *Baudin's Expedition*. The above quoted specimens from Dirk Hartog's Island and the Abrolhos, are very near it, but the leaves are broader. They are still thick and entire, but some of the Murchison river specimens have both the narrow and entire, and large and serrate leaves (all thick) on the same specimen.

3. *tuberculatum*. Leaves narrow, mostly serrate, rather thick and obtuse, sprinkled or covered with raised glandular dots.—*M. tuberculatum*, R. Br. Prod. 516; A. DC. Prod. xi. 710. Bartl. in Pl. Preiss. i. 349.—King George's Sound, *R. Brown* and others; Swan river, *Preiss. n.* 1351 (the latter approaching the var. *apiculatum*).

4. *subseriatum*. Leaves mostly oblong or lanceolate, serrate, not very thick. Calyx-segments short, as in all the preceding forms.—*M. subseriatum*, Nees in Pl. Preiss. i. 350.—S. coast of W. Australia, King George's Sound, *R. Brown* and others, extending to Swan river, *Drummond*, *Preiss. n.* 1247, and eastward to the Great Bight, *Maxwell*. This may be considered as the typical *M. serratum*, the typical *M. insulare* only differing in the leaves being altogether larger.

5. *pubescens*. Like the preceding variety, but the branches, leaves and calyxes copiously pubescent, with short spreading hairs. Ovary 2-celled only in the flowers examined.—Gale's Brook, W. Australia, *Maxwell*.

6. *glandulosum*. Leaves small in some specimens, 1 to 2 in. long in others; almost ovate, very tuberculate-glandular (more so than in the var. *tuberculatum*). Flowers small.—*M. viscosum*, R. Br. Prod. 516; A. DC. Prod. xi. 710; *M. glandulosum*, A. DC. l. c. 709, and (according to A. DC.) *Bertolonia glandulosa*, Spin. Jard. S. Sc. 1st. 25. f. 2.—Coast of S. Australia, *R. Brown* and others.

7. *gracile*. Leaves usually narrow, always acute and mostly serrate, thinner than in most of the preceding forms. Pedicels slender. Calyx-lobes subulate, often 1 to 1½ lines long, but very variable. Ovary cells usually 3.—*M. caprarioides*, Benth. in Hueg. Enum. 77; A. DC. Prod. xi. 707, *M. gracile*, Bartl. in Pl. Preiss. i. 350, A. DC. l. c. 708.—Common in W. Australia, *Preiss. n.* 1350, *Drummond*, *Oldfield*. Some of Brown's specimens are very nearly, if not quite, identical with this form.

8. *parviflorum*. Leaves small and narrow, sessile or nearly so, often tuberculate. Flowers and fruits very small. Calyx-segments slender, as in the last variety. Ovary cells 2 or 3.—Murchison river, *Oldfield*.

All the above varieties appear to be connected by several intermediate forms.

3. *M. deserti*, *A. Cunn.*; *Benth. in Hueg. Enum.* 78. An erect, glabrous shrub, nearly resembling the narrow-leaved varieties of *M. acuminatum*, but the leaves still narrower, linear or linear-lanceolate, acute or almost obtuse, entire, rather thick, 1 to 2 in. long, and narrowed into a very short petiole. Pedicels often several together, rather thick, and almost always remarkably recurved. Calyx and corolla about the size of the smaller-flowered varieties of *M. acuminatum*, but the corolla very regular, without any or with scarcely any hairs in the throat. Stamens 5, all equal in every one of the numerous flowers examined, the anthers not exerted. Ovary 2-celled or very rarely 3-celled, with 1 ovule in each cell. Fruit ovoid, "yellowish," 2 to 3 lines long, not compressed, usually with 2 cells and seeds.—A. DC. Prod. xi.

707; *M. strictum* and *M. patens*, A. Cunn. in A. DC. Prod. xi. 708; *M. dulce*, Benth. in Mitch. Trop. Austr. 384; *M. rugulosum*, F. Muell. in Linnæa, xxv. 427.

**Queensland.** Burdekin river, *F. Mueller*; Belyando and Balonne rivers, *Mitchell*; Nerook Creek, *Bowman*; Darling Downs, *Lau*.

**N. S. Wales.** Lachlan river, *A. Cunningham*; from the Murray and Darling to the Barrier Range, *Victorian and other Expeditions*; Mudgee, *Woolfs*; New England, *C. Stuart*.

**Victoria.** Murray river and Bacchus Marsh, *F. Mueller*.

**S. Australia.** From the Murray to St. Vincent's Gulf, Flinders Range, &c., *F. Mueller*; in the interior, *M'Douall Stuart's Expedition*.

**W. Australia.** Estuary of the Murchison, *Oldfield*; Shark's Bay, *Milne*.

4. *M. laxiflorum*, *Benth.* An erect shrub, closely allied to *M. deserti*, with the foliage and habit of the broader leaved forms of that species, differing chiefly in the larger flowers. Leaves narrow-lanceolate, acute, contracted into a short petiole. Pedicels solitary or 2 or 3 together, often  $\frac{1}{2}$  in. long. Calyx-lobes rather longer than in *M. deserti*. Corolla fully 5 lines long, the lobes bearded inside at the base or nearly glabrous. Stamens 5, all equal, included in the tube. Ovary 2-celled, with one ovule in each cell. Drupe succulent, with a hard putamen, not compressed.—*Eremophila myoporoides*, *F. Muell. Fragm.* v. 23.

**Queensland.** Cape river, *Bowman*; Rockhampton, *Thozet*.

I examined 4 ovaries and found them all 2-celled, with 1 ovule in each cell, and the drupe 1 cut across had also only 2 seeds; but in one drupe dissected by *F. Mueller* there were 4 cells and seeds. The ripe drupes were, however, all loose in the sheets with the specimens, and this one may have got mixed among them from some other species.

5. *M. parvifolium*, *R. Br. Prod.* 516. Stems procumbent, extending sometimes to 2 ft. or more, the whole plant glabrous. Leaves scattered, rather crowded, linear or linear-spathulate, obtuse, or rarely almost acute, entire, thick, and sometimes succulent, contracted at the base, and sometimes shortly petiolate, all under  $\frac{1}{2}$  in. in some specimens, above 1 in. in others. Flowers solitary or 2 or 3 together, on slender pedicels, sometimes very short, but often  $\frac{1}{2}$  in. long, or even more. Calyx-segments rather acute, about  $1\frac{1}{4}$  to  $1\frac{1}{2}$  line long. Corolla campanulate, glabrous inside or nearly so, about 4 lines long, the lobes at least as long as the tube. Stamens 4, often exceeding the lobes. Ovary 3- or 4-celled, with 1 ovule in each cell. Drupe ovoid-globular, attaining about 2 lines, the putamen with 3 or 4 cells and seeds, or fewer by abortion.—A. DC. Prod. xi. 710, Bot. Mag. t. 1693.

**Victoria.** Murray river, *F. Mueller, Herrgott*.

**Tasmania.** Flinders Island, *Milligan*.

**S. Australia.** Memory Cove, Spencer's Gulf, *R. Brown*; W. of Mount Sturgeon, *Robertson*; lagoons near Rivoli Bay and Holdfast Bay, *F. Mueller*; Port Lincoln, *Wilhelmi*; Spencer's Gulf, *Warburton*.

**W. Australia.** Goose Island Bay, *R. Brown*.

*M. humile*, *R. Br. Prod.* 516; A. DC. Prod. xi. 710, is founded upon specimens of what appears to me to be a slight variety of *M. parvifolium*, with rather shorter and broader leaves.

6. *M. brevipes*, *Benth.* The specimens have the aspect of some of the short, thick-leaved ones of *M. parvifolium*, but the stems may be erect. Leaves linear, obtuse, very thick, all under  $\frac{1}{2}$  in. long. Flowers



of the size of those of *M. parvifolium*, but different in shape. Pedicels mostly solitary, not above 2 lines long. Calyx-segments acute, about 1 line long. Corolla glabrous inside, the tube about 2 lines long, not much dilated upwards, the lobes nearly equal, scarcely 1 line long. Stamens 4, rather shorter than the lobes. Ovary 2-celled, with 1 ovule in each cell. Fruit oblong, not compressed, about 2 lines long.

**S. Australia.** From M'Douall Stuart's journey into the interior; only known from very few specimens.

7. **M. oppositifolium**, *R. Br. Prod.* 516. A weak shrub, ascending to 3 or 4 feet, usually bearing numerous resinous tubercular glands. Leaves opposite, sessile, and usually stem-clasping; lanceolate or oblong-lanceolate, acute, serrate,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long, the margins often recurved. Pedicels rather slender. Calyx-segments rather narrow, acute, rather long. Corolla very open, the lobes somewhat longer than the tube, very slightly bearded inside at the base. Stamens 4, the anthers short. Ovary 2- or 3-celled, with 1 ovule in each cell. Fruit small, globular, not compressed.—*A. DC. Prod.* xi. 710.

**W. Australia.** King George's Sound, *R. Brown*, *A. Cunningham*, and many others.

SECT. 2. DISOON. Calyx small, narrow. Ovary 2-celled, with 1 ovule in each cell. Fruit compressed.

8. **M. platycarpum**, *R. Br. Prod.* 516. A tall shrub, or small tree, quite glabrous. Leaves linear-lanceolate, acute, entire, or with a few small distant teeth in the upper part,  $1\frac{1}{2}$  to 3 in. long, rather thick, contracted into a short petiole. Pedicels often 6 or more in the axils, 1 to 2 lines long. Calyx not  $\frac{3}{4}$  line long, acutely lobed. Corolla more or less bearded inside at the throat, sometimes scarcely 2 lines long with the stamens included, in other specimens twice as large with exerted stamens. Ovary 2-celled, with 1 ovule in each cell. Fruit ovate or ovate-oblong, acute, much flattened, about 3 lines long.—*A. DC. Prod.* xi. 711.

**N. S. Wales.** Murray and Darling rivers, *Victorian and other Expeditions*.

**Victoria.** Wimmera, *Dallachy*.

**S. Australia.** Spencer's Gulf, *R. Brown*; Encounter Bay, *Whittaker*; Murray Scrub, *Behr.*; Elders and Flinders Range, Lakes Hindmarsh and Gairdner, *F. Mueller*.

9. **M. Beckeri**, *F. Muell.* An erect, much-branched shrub of several feet, strongly scented, and very viscous. Leaves alternate, oblong or lanceolate, rarely almost ovate, serrate, about  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, contracted into a petiole. Flowers shortly pedicellate, often 2 or 3 in the axil. Calyx 1 to  $1\frac{1}{4}$  lines long, deeply divided. Corolla-tube cylindrical to about 2 lines, then expanded into a small campanulate throat, the lobes spreading to 5 or 6 lines diameter, slightly bearded inside towards the base, the middle lower one larger and broader than the others, and slightly notched. Anthers 4, shortly protruding from the tube. Ovary 2-celled, with 1 ovule in each cell. Fruit ovate, acute, much flattened, exceeding the calyx, but not seen quite ripe.—*Disoon Beckeri*, *F. Muell. Fragm.* iv. 48; vi. 150; *Eremophila Beckeri*, *F. Muell. Fragm.* i. 156.

**W. Australia.** *Drummond, n. 338*; Phillips river and sand hummocks, Eyre's Relief, *Maxwell*.

Notwithstanding some approach in the form of the corolla to that of *Pholidia*, this species agrees in other respects much more with *Myoporum*, approaching very near *M. platycarpum* in the ovary and fruit.

10. **M. floribundum**, *A. Cunn. ; Benth. in Hueg. Enum. 78.* A glabrous, strong-scented shrub of 5 or 6 ft. Leaves very narrow, linear, acute, entire, 2 to 4 in. long on the main branches, often much smaller on the lateral ones. Flowers small, often numerous, in axillary clusters of 3 to 6, on filiform pedicels of 1 to 2 lines. Calyx-segments rather thick, acute,  $\frac{1}{2}$  to  $\frac{3}{4}$  lines long. Corolla-tube about 1 line long, lobes rather longer, almost acute, not much imbricate in the bud, glabrous inside. Stamens 4, rather longer or shorter than the corolla-lobes. Ovary compressed with a nerve-like border, 2-celled, with 1 ovule in each cell. Style filiform, the stigma obtuse. Fruit compressed, or at length somewhat turgid, very obtuse, almost truncate, 1 to  $1\frac{1}{4}$  lines long. — *Disoon floribundus*, *A. DC. Prod. xi. 703*; *F. Muell. Fragm. i. 126*.

**N. S. Wales.** Rocky banks of the Nepean river, *A. Cunningham*.

**Victoria.** Snowy river, *F. Mueller*.

11. **M. salsoloides**, *Turczan. in Bull. Soc. Imp. Nat. Mosc. 1863, ii. 226.* An erect, very much branched shrub of several feet, quite glabrous, but often glandular-tuberculate. Leaves very small (under 1 line long), but numerous, sessile, cordate, often broader than long, very thick, spreading. Flowers solitary in the axils, on short pedicels. Calyx not 1 line long, deeply divided into lanceolate lobes. Corolla  $2\frac{1}{2}$  to 3 lines long, the lobes longer than the tube, spreading, nearly equal. Stamens 4, exserted. Ovary 2-celled, with 1 ovule in each cell. Fruit small, obtuse, somewhat compressed, like that of *M. floribundum*. — *Disoon cordifolius*, *F. Muell. Fragm. i. 126*; *vi. 150*.

**W. Australia.** *Drummond, 5th coll. n. 339*; Gordon, Phillips, and Salt rivers, *Maxwell*.

SECT. 3. CHAMÆPOGONIA. Calyx-segments herbaceous. Ovary 2-celled, with 2 ovules in each cell. Fruit somewhat compressed.

12. **M. debile**, *R. Br. Prod. 516.* A low glabrous shrub, with a thick stock and decumbent or ascending stems, attaining sometimes 2 ft. or more, the branches often glandular-tuberculate. Leaves alternate, very shortly petiolate, or nearly sessile, elliptical oblong or lanceolate, entire or with a few small distant acute teeth, and often one or two larger ones on each side near the base,  $1\frac{1}{2}$  to 3 or even 4 in. long. Pedicels solitary in the axils or in pairs, rarely so long as the calyx. Calyx-segments linear but leaf-like, acute, 3 to 4 lines long. Corolla pink or purplish, the tube about as long as the calyx, the lobes not half so long, more or less bearded inside at the base. Stamens included in the tube. Ovary 2-celled, with 2 collateral ovules in each cell. Fruit ovoid, somewhat compressed, 3 to 4 lines long, often furrowed on each side, 2-celled. Seeds either 2 in each cell more or less separated by an





imperfect dissepiment, or more frequently solitary by the abortion of the other ovule.—Bot. Mag. t. 1830, A. DC. Prod. xi. 711; *Pogonia debilis*, Andr. Bot. Rep. t. 212; *Andreusia debilis*, Vent. Jard. Malm. under n. 108; *Myoporum diffusum*, R. Br. Prod. 516, A. DC. Prod. xi. 711; *Capraria calycina*, A. Gray, in Proc. Amer. Acad. vi. 49; Benth. Fl. Austral. above, iv. 503.

**Queensland.** Keppel and Shoalwater Bays and Broad Sound, *R. Brown*; Dawson river, Brisbane river, Moreton Bay, *F. Mueller*; Rockhampton, *Dallachy* and others; Nerook Creek, Connor's river, *Bowman*; Darling Downs, *Lau*.

**N. S. Wales.** Port Jackson to the Blue Mountains, *R. Brown* and others; Hunter's river, *A. Cunningham* and others; Clarence river, *Beckler*; Richmond river, *Fawcett*.

Since the publication of the last volume, Dr. Torrey has kindly re-examined and sent me a flower from the specimen inadvertently described by A. Gray as a *Capraria*, of which it had so much the aspect, and to which species I had probably myself referred it on a first hasty sorting.

*Doubtful Species.*

13. **M. mucronulatum**, A. DC. Prod. xi. 706. A glabrous shrub with the aspect foliage and flowers nearly of the var. *apiculatum* of *M. serratum*, but said to have a very different ovary and fruit. Leaves oblong or oblanceolate, obtuse, mucronate, much contracted into a petiole, rather thick, quite entire, 1 to 2 in. long. Pedicels 2 to 4 together, 2 to 4 lines long. Calyx-lobes short. Corolla-lobes slightly bearded inside. Fruit ovoid-globular, 2-celled, with 2 seeds in each cell, not separated by any spurious dissepiment.

**N. S. Wales.** "East Coast" *Herb. Mus. Par.* I have seen the specimen described by De Candolle, but have not had the opportunity of examining the ovary or fruit. The stations given for Australian plants from the collections of Baudin and other early navigators are not to be depended upon, the "côte occidentale" or "côte orientale" being sometimes attached to plants from the Recherche Archipelago or from the north coast.

2. **PHOLIDIA**, R. Br.

(*Pseudopholidia*, A. DC.; *Sentis*, *Duttonia* and *Pholidiopsis*, *F. Muell.*)

Calyx divided to the base, with 5 or rarely 4 segments, often unequal, somewhat dilated and much imbricate at the base, acuminate, not enlarged after flowering. Corolla-tube shortly cylindrical at the base, expanded into an obliquely campanulate throat, the limb of five spreading lobes, not very unequal, the 2 upper ones usually rather more united. Stamens 4, didynamous, usually exerted from the corolla-tube, but shorter than the lobes. Ovary 2-celled, with 2 ovules, or very rarely only 1 in each cell; style usually longer than in *Myoporum*, and hooked at the end. Fruit a dry or rarely succulent drupe, 2-celled, or more or less perfectly 4-celled, with 1 seed in each cell.—Shrubs. Leaves alternate scattered or irregularly opposite, entire or toothed. Flowers axillary, solitary and sessile, or on very short pedicels (except in *P. santalina*).

The genus is limited to Australia. In the typical forms it differs from *Myoporum* in the more perfectly divided calyx, the shape of the corolla, the more didynamous stamens, as well as in the ovary and fruit and inflorescence, but *Myoporum Beckeri* has almost the corolla and *M. debile* the ovary of *Pholidia*, whilst *Pholidia brevifolia* and perhaps

*P. Delisserii* have only 1 ovule in each of the ovary-cells as in the majority of *Myopora*. From *Eremophila*, *Pholidia* differs in the more regular corolla, the calyx-segments never enlarged after flowering, the stamens not exerted, the ovules never superposed in each half cell, and the fruit not separating into 1-seeded nuts as in the section *Eremocosmos*, nor so succulent as in *Stenochilus*, but none of the latter characters are constant through all the species of *Eremophila*, and the fruits of some species are as yet unknown. The distinction between *Pholidia* and *Eremophila* is not, therefore, more definite than that between *Pholidia* and *Myoporum*.

Leaves mostly opposite, hoary or white, almost scaly, usually recurved at the end. Flowers sessile or nearly so.

Leaves narrow-linear,  $\frac{3}{4}$  to 1 in. long . . . . . 1. *P. Dalyana*.

Leaves narrow-linear, rarely above  $\frac{1}{2}$  in. long . . . . . 2. *P. scoparia*.

Leaves obovate or oblong, 3 to 4 lines long . . . . . 3. *P. Delisserii*.

Leaves alternate, obovate, or ovate, 3 to 5 lines long. Flowers sessile or nearly so.

Leaves very thick, complicated and recurved, glaucous or hoary . . . . . 4. *P. crassifolia*.

Leaves rather thick, white on both sides, resinous . . . . . 5. *P. resinosa*.

Leaves rather thin, green, often toothed.

Leaves obovate or cuneate, acute, mostly toothed. Ovules 2 in each cell . . . . . 6. *P. Behriana*.

Leaves ovate or elliptical-oblong, entire. Ovules 2 in each cell . . . . . 7. *P. Woollsiana*.

Leaves ovate, entire or toothed. Ovules 1 in each cell . . . . . 8. *P. brevifolia*.

Leaves alternate, entire, crowded or imbricate,  $\frac{1}{2}$  to 1 in. long. Flowers sessile or nearly so.

Leaves oval or oblong, white-tomentose. Ovary glabrous . . . . . 9. *P. imbricata*.

Leaves linear, acute, glabrous. Ovary woolly . . . . . 10. *P. densifolia*.

Leaves alternate, narrow or small, not crowded. Flowers sessile or nearly so.

Leaves small, erect, with a few large tubercles. Fruit compressed, obtuse, not exceeding the calyx . . . . . 11. *P. gibbifolia*.

Leaves linear, entire. Branches divaricate, often spinescent. Fruit beaked . . . . . 12. *P. divaricata*.

Leaves linear, not gibbous, erect. Branches erect, hoary-pubescent or nearly glabrous. Leaves 2 to 4 lines long . . . . . 13. *P. microtheca*.

Very viscid-pubescent. Leaves 1 in. long . . . . . 14. *P. adenotricha*.

Leaves narrow-lanceolate, above 1 in. long. Pedicels about  $\frac{1}{2}$  in. long . . . . . 15. *P. santalina*.

1. ***P. Dalyana*, F. Muell.** Very closely allied to *P. scoparia*, and perhaps a variety only, differing in the leaves longer and more slender, usually  $\frac{3}{4}$  to 1 in. long, the corolla-tube not so much contracted at the base, and the ovary densely villous instead of being scaly only.—*Eremophila Dalyana*, F. Muell. *Fragm.* v. 22.

**S. Australia.** Between Cooper's Creek and Stoke's Range, *Howitt's Expedition*. There is but a single specimen (*Herb. F. Muell.*), and I could only examine one ovary, which was 2-celled as in *P. scoparia*, but one ovule of each cell was very small and probably abortive.

2. ***P. scoparia*, R. Br. Prod.** 517. An erect shrub, hoary or almost silvery, with a close more or less scaly indumentum, the branches rigid, but not thick, with prominent angles decurrent from the leaves. Leaves mostly opposite or nearly so, narrow-linear with hooked points, rather thick, keeled underneath, channelled above, rarely exceeding  $\frac{1}{2}$  in. in length. Flowers of a pale violet blue, solitary on short axillary pedicels, without bracts. Calyx  $1\frac{1}{4}$  to  $1\frac{1}{2}$  line long,





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*Eremophila Delisserii*. F. M.



deeply divided into 5 acute keeled segments. Corolla 8 to 9 lines long, the narrow part of the tube twice as long as the calyx, hairy inside at the top, the broad, almost campanulate, upper part or throat at least as long as the narrow part, the lobes much shorter, and nearly equal. Stamens inserted at the top of the narrow part of the tube, and about as long as the broad part. Ovary 2-celled, with 2 ovules in each cell. Fruit ovoid or ovoid-oblong, nearly 3 lines long, the putamen completely 4-celled, with 1 seed in each cell.—Endl. Iconogr. t. 66; A. DC. Prod. xi. 713; *Eremophila scoparia*, F. Muell. in Proc. R. S. Tasm. iii. 296, Fragn. v. 22.

**N. S. Wales.** Nandirooga Creek and towards the Barrier Range, *Victorian Expedition*.

**S. Australia.** Head of Spencer's Gulf, *R. Brown*; in the scrub from the Murray river to St. Vincent's Gulf, *F. Mueller*; Gawler ranges, *Sullivan*; Lake Gairdner, *Babbage*; head of the Great Australian Bight, *Delisser*.

**3. P. Delisserii**, *F. Muell.* A shrub of 2 to 3 ft., the branches and foliage hoary or white with a close tomentum, and sometimes glandular-tubercular. Leaves mostly opposite, from obovate to oblong, obtuse, recurved, contracted into a short petiole, 3 to 4 lines long. Flowers sessile, only seen in very young buds; but according to *F. Mueller's* description and figure, the calyx-segments narrow, woolly, imbricate, about  $2\frac{1}{2}$  lines long, not enlarged after flowering, the corolla nearly 8 lines long, tomentose outside, the cylindrical portion of the tube nearly as long as the calyx, with a ring of wool inside at the top, the broad part campanulate, the lobes ovate-oblong, obtuse, nearly equal. Ovary densely woolly with white plumose hairs, and, as far as I could ascertain in the very young one examined, with only 1 ovule in each cell.—*Eremophila Delisserii*, *F. Muell.* Fragn. v. 108, t. 41.

**W. Australia.** N.W. of the head of the Great Australian Bight, *Delisser*; a single fragment in *Herb. F. Mueller*.

**4. P. crassifolia**, *F. Muell.* in *Linnaea*, xxv. 430. An erect shrub of several feet, quite glabrous, but often glaucous and minutely scaly. Leaves broadly ovate, obtuse, thickly coriaceous, folded longitudinally, and often recurved, narrowed into a short petiole, 3 to 5 lines long. Flowers small, almost sessile, and solitary in the axils. Calyx-segments ovate-lanceolate, acutely acuminate, keeled, with thin and sometimes slightly ciliate margins, about 2 lines long, the inner ones rather smaller. Corolla not twice as long as the calyx, the lobes nearly equal and rather longer than the tube, the narrow part of the tube very short. Stamens didynamous. Ovary 2-celled, with 2 ovules in each cell. Fruit small, rugose, slightly compressed, obtuse, shorter than the calyx, the putamen more or less completely 4-celled when ripening all the seed.—*Eremophila crassifolia*, *F. Muell.* in Proc. R. Soc. Tasm. iii. 297.

**S. Australia.** About Mount Greenly, Dombey Bay, Spencer's Gulf, *Wilhelmi*; Venus Bay, *Warburton*.

**5. P. resinosa**, *Endl. Nov. Stirp. Dec.* 50. Branches densely covered with a white tomentum and sprinkled with resinous tubercles. Leaves

alternate, obovate, obtuse with a minute point, rather thick, flat, 4 lines long, hoary with stellate hairs on both sides. Peduncles axillary, solitary, exceedingly short. Calyx-segments linear-lanceolate, acute, 3 lines long. Corolla funnel-shaped,  $6\frac{1}{2}$  lines long, the tube scarcely exceeding the calyx, the throat dilated, the lobes nearly equal, scarcely more than  $\frac{1}{2}$  line long, the upper ones recurved, the lower ones spreading; all sprinkled outside with stellate hairs. Stamens included in the tube. Ovary densely tomentose, 4-celled, with 1 ovule in each cell (or 2-celled with 2 ovules in each cell ?)—A. DC. Prod. xi. 713; *Eremophila resinosa*, F. Muell. in Proc. R. Soc. Tasm. iii. 206.

**W. Australia.** Between King George's Sound and Swan river, T. S. Roe. The specimen is a very poor one. The above description is taken chiefly from Endlicher's.

6. **P. Behriana**, F. Muell. in *Linnaea*, xxv. 430. A low shrub, with erect, rather slender glabrous or pubescent branches. Leaves obovate or cuneate, mucronate-acute, often toothed in the upper part, contracted at the base but scarcely petiolate, rather rigid and occasionally veined, 3 to 4 lines long. Flowers nearly sessile, solitary in the axils. Calyx-segments narrow-lanceolate, acute, the outer ones  $2\frac{1}{2}$  lines long, the inner ones rather smaller. Corolla about 4 to 5 lines long, the tube gradually enlarged from near the base, the lobes short and broad, the middle lower one broader than the others, all bearded inside at the base. Stamens included in the tube. Ovary oblong, 2-celled, with 2 ovules in each cell (or one occasionally abortive ?).—*Eremophila Behriana* or *Behrii*. F. Muell. in Proc. R. Soc. Tasm. iii. 296, Rep. Babb. Exped. 18.

**S. Australia.** In the scrub near Gawler river, Behr.; Tumby Bay and hills near Port Lincoln, F. Mueller: Kangaroo Island, Waterhouse.

7. **P. Woollsiana**, F. Muell. An erect shrub of 3 to 4 ft., the branches hoary with a very short minutely plumose pubescence. Leaves alternate, ovate or oblong, elliptical, obtuse or almost acute, 1-nerved, rather thick, glabrous, entire (or rarely slightly toothed ?), narrowed at the base but sessile, 2 to 4 lines long. Flowers "puce-coloured," axillary, on very short pedicels. Calyx-segments narrow-lanceolate, acute or rather obtuse, not 2 lines long. Corolla 5 to 6 lines long, the cylindrical part of the tube about as long as the calyx, the obliquely campanulate broad part rather longer, the lobes short and broad, the 2 upper ones more united, and the middle lower one broader than the others. Stamens not exerted. Ovary 2-celled, with 2 ovules in each cell. Fruit scarcely as long as the calyx, slightly compressed, broadly ovate, rugose, slightly furrowed on each side, more or less perfectly 4-celled, or with fewer cells and seeds by abortion.—*Eremophila Woollsiana*, F. Muell. Fragm. i. 125, t. 7.

**W. Australia.** Salt river, Stokes Inlet, Oldfield river, Maxwell.

8. **P. brevifolia**, Benth. A tall, erect, much-branched shrub, quite glabrous. Leaves alternate, sessile and more or less stem-clasping, broadly ovate, obtuse, entire or coarsely toothed, usually concave, 3 to 4 or sometimes 5 lines long. Flowers "white," solitary, on very short axillary pedicels. Calyx-segments very narrow, acute, about 2 lines

long. Corolla-tube nearly 5 lines long, broad, hairy inside, very shortly contracted at the base, the lobes scarcely 1 line long, the middle lower one broader than the others. Ovary quite glabrous, 2-celled, with only 1 ovule in each cell in all the flowers examined. Fruit not known.—*Myoporum brevifolium*, Bartl. in Pl. Preiss. i. 350; *Pseudopholidia brevifolia*, A. DC. Prod. xi. 704.

**W. Australia.** Swan river, *Drummond*, 1st coll. n. 445, *Preiss.* n. 2335 and 2382.

9. **P. imbricata**, *Benth.* An erect shrub, densely clothed with a hoary or white tomentum. Leaves crowded and imbricate, ovate or oblong, obtuse, sessile and very shortly contracted at the base, thick and soft, entire,  $\frac{1}{2}$  to nearly 1 in. long. Flowers sessile and shorter than the leaves. Calyx-segments narrow, softly tomentose, 2 to  $2\frac{1}{2}$  lines long, not enlarging after flowering. Corolla glabrous, apparently of the shape of other *Pholidia*, but not seen perfect. Drupe glabrous, ovoid, as long as the calyx, slightly succulent, the endocarp hard, completely 4-celled, with one seed in each cell.

**W. Australia.** Between Moore and Murchison rivers, *Drummond*, 6th coll. n. 147. I have seen the ovary only in a far advanced state, but could find no trace of the lower abortive ovules of most species of *Eremophila*.

10. **P. densifolia**, *F. Muell.* Branches virgate, glabrous or sprinkled with a small minutely plumose pubescence, which is also sometimes on the margins of the leaves, and more abundant on the margins of the sepals and on the ovary. Leaves rather crowded, linear or narrowly linear-lanceolate, very acute, sessile, thick, convex underneath, mostly about  $\frac{1}{2}$  in. long on the main branches, much smaller on the lateral ones. Flowers almost sessile and nearly exceeding the leaves. Calyx-segments narrow, acute, the outer ones about 2 lines long, the inner ones smaller. Corolla "blue," about 5 lines long, the narrow part of the tube very short, the lobes scarcely as long as the tube, the 4 upper ones almost acute, contorted in the bud, the lowest broader and obtuse. Stamens didynamous. Ovary 2-celled, with 2 ovules in each cell, densely tomentose-villous. Drupe tomentose, slightly compressed, obtuse, shorter than the calyx, the endocarp completely divided into 4 cells (or fewer by abortion) with 1 seed in each cell.—*Eremophila densifolia*, *F. Muell.* *Fragm.* ii. 160.

**W. Australia.** E. Mount Barren and Stokes Inlet, *Maxwell*.

11. **P. gibbifolia**, *F. Muell.* An erect shrub of 1 to 2 ft., with numerous virgate branches, glabrous or minutely scaly-pubescent. Leaves linear or linear-oblong, sessile, erect, 1 to 3 lines long, remarkable for several large tubercular swellings on the back. Flowers nearly sessile. Calyx-segments subulate-acuminate, often above 2 lines long. Corolla fully  $\frac{1}{2}$  in. long, the tube shortly cylindrical at the base, the upper part much dilated and oblique, the lobes short. Stamens didynamous. Ovary oblong, 2-celled, with 2 ovules in each cell. Fruit oblong, compressed, not exceeding the calyx, completely 4-celled, with 1 seed in each cell, or with fewer cells and seeds by abortion.—*Duttonia gibbifolia*, *F. Muell.* in *Hook. Kew Journ.* viii. 73, t. 1., and in *Trans.*

Vict. Inst. 1855, 41; *Eremophila gibbosifolia*, F. Muell. Rep. Babb. Exped. 18.

**Victoria.** Wimmera, *Dallachy*.

**S. Australia.** Rocky hills between the Murray river and St. Vincent's Gulf, *F. Mueller*; Tattiarra Country, *Wood*.

12. ***P. divaricata***, *F. Muell. in Hook. Kew Journ.* viii. 201, and in *Trans. Phil. Soc. Vict.* i. 47. An erect shrub of several feet, with divaricate branches, sometimes spinescent and quite glabrous, or with a line of short hairs above each leaf. Leaves linear or linear-cuneate, obtuse, narrowed at the base, rarely above  $\frac{1}{2}$  inch long and often smaller, usually drying black. Flowers "purple or white, often spotted," solitary and nearly sessile in the axils. Calyx-segments 4 or 5, broad at the base, acuminate, slightly pubescent or ciliate, about 2 to  $2\frac{1}{2}$  lines long. Corolla densely stellate-pubescent outside, under  $\frac{1}{2}$  in. long, the cylindrical base shorter than the calyx, the throat obliquely campanulate, the middle lower lobe rather larger and broader than the others and very hairy inside, the hairs continued to the base of the tube as in most *Pholidias*, the 2 upper lobes shortly united. Filaments hairy at the base. Ovary glabrous, 2-celled, with 2 ovules in each cell. Ripe fruit ovoid at the base, tapering into a beak, the whole about 4 lines long, more or less perfectly 4-celled, with 1 seed in each cell.—*Sentis rhynchocarpa*, *F. Muell. Fragm.* iv. 48, vi. 150; *Eremophila divaricata*, *F. Muell. in Trans. R. Soc. Tasm.* iii. 293.

**N. S. Wales.** Murray river, *F. Mueller*; Darling river, *Victorian Expedition, Mrs. Ford*; tributaries of the upper Darling, *Bowman*.

**S. Australia.** Murray desert, *F. Mueller*; Lake Alexandrina, *Hildebrand*.

13. ***P. microtheca***, *F. Muell.* An erect almost heath-like shrub, the branches and young leaves hoary with a very short minutely plumose, almost farinaceous pubescence, the older foliage glabrous or nearly so. Leaves rather crowded, linear, somewhat obtuse, slightly contracted at the base, 2 to 4 lines long. Flowers "lilac," on very short axillary pedicels. Calyx-segments plumose-pubescent, about 2 lines long. Corolla like that of *P. Woollsiana*, but rather smaller. Ovary rugose, 2-celled, with 2 ovules in each cell. Fruit rugose like that of *E. Woollsiana*, but smaller and not compressed, the only one seen was, however, not quite perfect.—*Eremophila Woollsiana* var. *angustifolia*, *F. Muell. Fragm.* ii. 160; *E. microtheca*, *F. Muell. Herb.*

**W. Australia.** Port Gregory, Murchison river, *Oldfield*.

14. ***P. adenotricha***, *F. Muell.* Densely clothed with a glandular-ferruginous or dingy viscid pubescence. Leaves crowded, linear, obtuse, rather thick and soft, viscid-pubescent on both sides, about 1 in. long. Flowers solitary and sessile. Calyx-segments linear, nearly equal, and not so imbricate as in the other species, ciliate and viscid-pubescent, 3 to  $3\frac{1}{2}$  lines long, not enlarged after flowering. Corolla glabrous outside, about  $\frac{3}{4}$  in. long, the cylindrical part of the tube nearly as long as the calyx, the upper part much enlarged; the lobes broad, short and nearly equal. Stamens not examined. Drupe slightly succulent, ovoid, shorter



F. Schoenfeld del. & lith.

Muenster auct.

Hamm. & Co. sculp.

# *Eremophila Woollsiana*. F.M.

*in ca. ...*

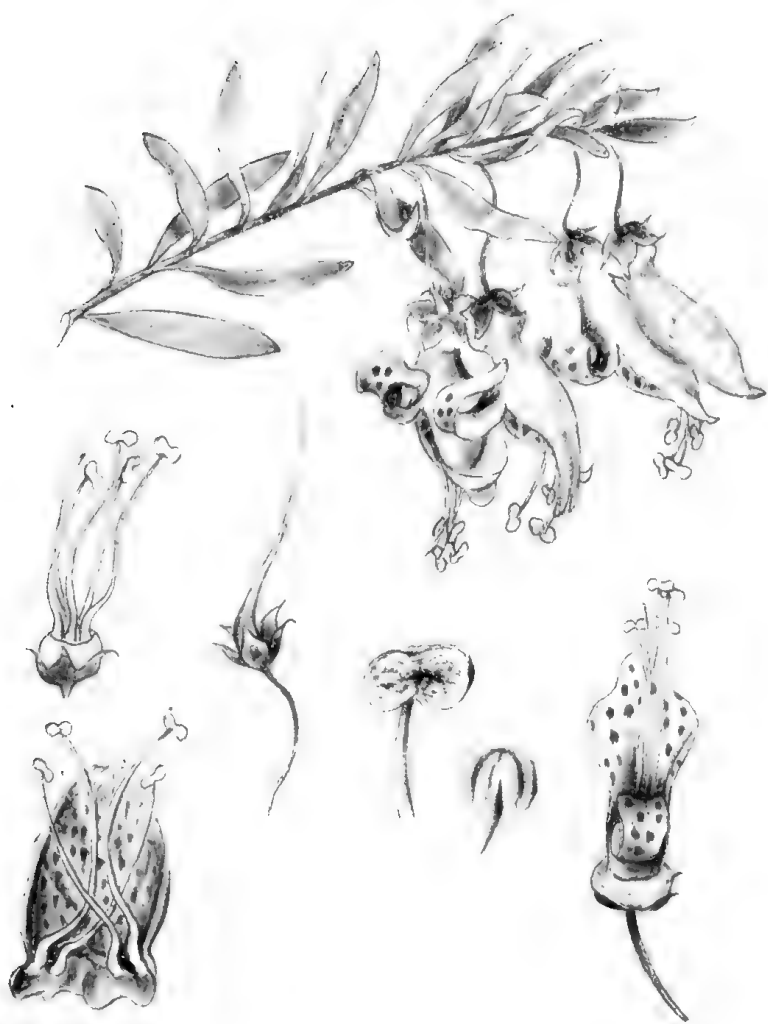












*Asclepias tuberosa* L.  
Butterfly-weed  
Common in the fields and woods  
of the United States.

than the calyx, the putamen thick and long, 4-celled, with 1 seed in each cell.—*Eremophila adenotricha*, F. Muell. Herb.

**W. Australia.** Herb. F. Mueller.

15. **P. santalina**, F. Muell. An erect glabrous shrub of several feet, slightly glandular-verrucose. Leaves narrow lanceolate, acuminate, entire, narrowed into a rather long petiole, rather thick,  $1\frac{1}{2}$  to 2 in. long. Flowers "white," solitary in the axils, on pedicels usually of about  $\frac{1}{2}$  in., thickened under the flower. Calyx-segments narrow, acuminate, not 2 lines long, imbricate at the base. Corolla-tube with the cylindrical part nearly as long as the calyx, the upper part broad, about 3 lines long, glabrous inside or nearly so, the lobes scarcely 2 lines long, the 4 upper ones ovate, spreading, with short recurved points or almost obtuse, the 2 uppermost of them ascending, the middle lower lobe twice as broad as the others. Stamens included, didynamous. Ovary glabrous, 2-celled, with 2 ovules in each cell. Drupe succulent, the putamen more or less perfectly 4-celled, with 1 seed in each cell, or more frequently reduced by abortion to 1 or 2 cells and seeds.—*Pholidiopsis santalina*, F. Muell. in *Linnaea*, xxv. 429; *Eremophila santalina*, F. Muell. in *Proc. R. Soc. Tasm.* iii. 295.

**S. Australia.** Rocky hills near Cudnaka, F. Mueller.

This species differs from all the others of the genus in its elongated pedicels, like those of *Myoporum*; they are, however, solitary, and the calyx, corolla, and ovary are those of *Pholidia* rather than of *Myoporum* or *Eremophila*.

### 3. EREMOPHILA, R. Br.

(*Stenochilus*, R. Br. *Eremodendron*, DC.)

Calyx divided to the base into 5 segments or rarely 5-lobed, often but not always enlarged after flowering. Corolla-tube usually broad from the base or constricted above the ovary, more or less elongated and incurved, very rarely with the cylindrical base of *Pholidia*, the limb oblique or 2-lipped, 5-lobed. Stamens 4, didynamous, often exserted. Ovary 2-celled, with 2 or 3 superposed pairs of ovules in each cell, of which, however, the lower pairs remain usually unfecundated, or in a very few species only one pair in each cell at the time of flowering. Style filiform. Fruit, where known, a dry or succulent drupe, the putamens separating into 4 1-seeded pyrenes, or 4-celled with one seed in each cell, or fewer cells and seeds by abortion.—Shrubs. Leaves alternate or scattered. Flowers solitary, or in a few species several together in the axils, usually pedicellate, without bracts.

The genus is limited to Australia. As will be seen by the above character, there is no positive combination of characters to separate it from *Pholidia*, being connected with that genus, as *Pholidia* is with *Myoporum*, by exceptional species. The habit is, however, different, and there are always either the superposed ovules or the enlarged fruiting calyx, and often the succulent fruit, to distinguish *Eremophila*. On the other hand, the five sections into which I have divided *Eremophila* may perhaps one day be admitted as genera, which I have been unwilling to do whilst the ripe fruit of so many species is unknown, especially as there appears to be a greater proportion of intermediate species between them than between the three Myoporineous genera here adopted. F. Mueller

(Fragm. vi.) unites *Pholidia* with *Eremophila*, retaining *Myoporum*, *Disoon*, and *Sentia* as distinct, but has not published the definite distinctive character he relies upon.

SECT. I. **Eriocalyx**.—*Calyx-segments not overlapping, thick and soft, densely tomentose, not becoming scarious after flowering. Ovary with two pairs of ovules in each cell. Fruit unknown.*

Flower nearly sessile. Leaves obovate to lanceolate, short, densely tomentose.

Corolla and ovary tomentose. Corolla lobes all broad and obtuse.

Stamens included . . . . . 1. *E. Mackinlayi*.

Corolla and ovary glabrous.

Corolla lobes obtuse. Stamens included . . . . . 2. *E. Bowmanni*.

Corolla upper lobes small and acute. Stamens exserted . . . . . 3. *E. leucophylla*.

Flowers distinctly pedunculate. Leaves obovate, oblong, densely tomentose,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Corolla tomentose. Ovary glabrous . . . . . 4. *E. Forrestii*.

Flowers distinctly pedunculate. Leaves linear or linear-lanceolate, mostly above 1 in. long.

Calyx clothed with a long loose plumose wool. Leaves woolly when young, at length nearly glabrous . . . . . 5. *E. eriocalyx*.

Calyx shortly stellate-tomentose. Leaves closely tomentose, not becoming glabrous . . . . . 6. *E. Maitlandii*.

SECT. II. **Eremocosmos**.—*Calyx-segments not at all or scarcely overlapping at the base, more or less enlarged, veined, and scarious after flowering. Ovary with 2 to 4 pairs of ovules in each cell (except in E. oppositifolia and E. Paisleyi). Fruit (where known) dry, the endocarp separating into distinct pyrenes.*

Enlarged calyx-segments more or less cuneate and obtuse.

Leaves small, short, broad, thick, and hoary . . . . . 7. *E. rotundifolia*.

Leaves linear or linear-lanceolate. Corolla lobes obtuse. Stamens included or shortly exserted.

Ovary shortly hairy, with 1 pair of ovules to each cell.

Corolla above 1 in. long. Stamens often exserted. Leaves 1 to 2 in. long . . . . . 8. *E. oppositifolia*.

Corolla  $\frac{1}{2}$  in. long, stamens included . . . . . 9. *E. Paisleyi*.

Ovary very woolly, with 2 to 4 pair of ovules to each cell.

Leaves narrow, linear . . . . . 10. *E. Sturtii*.

Leaves linear-lanceolate . . . . . 11. *E. Mutchelli*.

Enlarged calyx-segments oblong or lanceolate, acute. Leaves linear or linear-lanceolate.

Corolla-lobes all broad. Stamens included . . . . . 12. *E. Clarkii*.

Corolla upper lobes rather acute. Stamens exserted . . . . . 13. *E. Latrobii*.

SECT. III. **Platycalyx**.—*Calyx campanulate, 5-lobed. Flowers and fruit of Platychilus.*

Single species . . . . . 14. *E. Macdonellii*.

SECT. IV. **Platychilus**.—*Calyx-segments much imbricate at the base (except in the first species), the outer ones usually broader. Corolla-lobes all broad and obtuse, or the upper ones scarcely acute. Stamens included or scarcely exserted. Ovules in 2 or 3 pairs in each cell. Fruit of Stenochilus.*

Calyx-segments small or narrow and acute, not enlarged after flowering. Leaves long, linear or lanceolate.

Corolla tube not much enlarged upwards. Calyx-segments nearly linear . . . . . 15. *E. graciliflora*.

Corolla tube much enlarged upwards. Calyx-segments small, very acute, from a broad base . . . . . 16. *E. longifolia*.

Calyx-segments ovate or lanceolate, acute, not exceeding 3 lines in flower, nor much enlarged afterwards. Plants very glabrous, often drying blue.

Erect, virgate and very glutinous. Leaves narrow-linear.

Corolla-tube cylindrical at the base, as in *Pholidia* . . . . . 17. *E. Drummondii*.

- Very divaricately branched. Leaves narrow-linear. Corolla-tube very broad and enlarged from the base . . . . . 18. *E. polyclada*.  
 Moderately spreading. Leaves lanceolate or linear-lanceolate, usually long. Corolla-tube broad and enlarged from the base . . . . . 19. *E. bignoniæflora*.  
 Calyx-segments lanceolate or the outer ones ovate, 3 to 6 lines long. Plant hoary-tomentose or at length glabrous . . . . . 20. *E. Freelingii*.  
 Calyx-segments broad-lanceolate, 4 to 6 lines long, more or less hirsute.  
 Leaves linear or lanceolate . . . . . 21. *E. Goodwinii*.  
 Leaves obovate or oblong, serrulate . . . . . 22. *E. Willsii*.  
 Calyx-segments obtuse, very much enlarged coloured and scarious after flowering. Leaves linear-lanceolate.  
 Stamens included. Plant hoary-tomentose or glabrous . . . . . 23. *E. platycalyx*.  
 Stamens exserted. Plant glabrous . . . . . 24. *E. viscida*.

SECT. V. **Stenochilus**.—*Calyx-segments imbricate at the base, usually enlarged after flowering. Corolla 4 upper lobes short and acute, the fifth lowest more deeply separated and sometimes narrow. Stamens exserted (except E. alternifolia). Ovules 2 or 3 pairs, or rarely only 1 pair in each cell. Drupe (except E. alternifolia) succulent, with a thick bony putamen not separating into nuts.*

Peduncles usually shorter than the calyx, not flexuose.

Calyx-segments lanceolate, small in flower and not much enlarged afterwards.

Leaves linear or lanceolate, hoary-tomentose or at length glabrous . . . . . 25. *E. Brownii*.

Leaves ovate-oblong, crowded, tomentose, more or less floccose . . . . . 26. *E. subfloccosa*.

Calyx-segments oblong, rather obtuse, enlarged after flowering . . . . . 27. *E. Oldfieldii*.

Peduncles longer than the calyx, very spreading, usually flexuose.

Leaves narrow-lanceolate, entire. Ovules, 2 pairs in each cell.

Lowest corolla-lobe obtuse. Calyx much enlarged after flowering . . . . . 28. *E. Duttonii*.

Lowest corolla-lobe acute. Calyx-segments acute scarcely enlarged after flowering . . . . . 29. *E. maculata*.

Leaves lanceolate or ovate, often denticulate. Ovules 1 pair in each cell.

Leaves mostly lanceolate. Calyx-segments lanceolate, scarcely enlarged after flowering . . . . . 30. *E. denticulata*.

Leaves mostly ovate. Calyx-segments ovate, much enlarged after flowering . . . . . 31. *E. latifolia*.

Leaves narrow-linear. Calyx-segments much enlarged after flowering. Ovules 1 pair in each cell. Stamens included . . . . . 32. *E. alternifolia*.

SECT. 1. **ERIOCALYX**.—*Calyx-segments not overlapping at the base, thick and soft, densely tomentose, sometimes enlarged but not scarious after flowering. Ovary with 2 pairs of ovules in each cell.*

The species of this section have rather more the habit of *Pholidia* than of *Eremophila*, but the shape of the corolla and the superposed ovules are those of the latter genus. Most of the species have however been described from very imperfect specimens.

1. **E. Mackinlayi**, *F. Muell. Fragm.* iv. 80. A shrub of several feet, densely clothed with a hoary or yellowish soft and almost woolly tomentum. Leaves obovate broadly ovate or almost orbicular, contracted below the middle but broadly sessile, and sometimes dilated at the very base, thick, 4 to 8 lines long in the only specimens seen.

Flowers "purple," nearly sessile and solitary. Calyx-segments narrow-lanceolate, rather obtuse, densely tomentose, about 4 lines long, scarcely imbricate, apparently becoming enlarged after flowering. Corolla rather above 1 in. long, slightly constricted above the ovary, then almost campanulate, tomentose outside, partially woolly inside, the lobes all broad, obtuse, or with a very short point in the centre, the middle lowest one rather broader than the others. Stamens included. Ovary woolly-tomentose, with 2 pairs of ovules in each cell. Fruit unknown.

**W. Australia.** Sharks Bay, *Maitland Brown* (a single specimen in herb. F. Muell.).

2. **E. Bowmanni**, *F. Muell. Fragm.* ii. 139. Densely clothed with a white or hoary tomentum, either short and close or looser and plumose. Leaves oblong or lanceolate, obtuse, rather thick, entire, contracted at the base but scarcely petiolate, tomentose on both sides, the midrib prominent underneath, under  $\frac{1}{2}$  in. long when broad, nearly 1 in. when narrow. Flowers "blue," solitary, on pedicels of 3 to 6 lines. Calyx-segments 5 to 7 lines long, oblong-linear, rather obtuse, tomentose on both sides, rather unequal, but scarcely imbricate. Corolla glabrous outside, about 1 in. long, the tube slightly contracted above the ovary, then broad, the lobes broad and obtuse, the middle lower one rather narrower than the others. Stamens included. Ovary glabrous, narrow, with 2 pairs of ovules to each cell.

**N. S. Wales.** Darling desert, *Neilson* (with short leaves and a close tomentum); tributaries of the upper Darling, *Bowman* (with long leaves and a loose tomentum)—both mere fragments in herb. F. Mueller.

3. **E. leucophylla**, *Benth.* Densely clothed with a white or hoary tomentum either close and short or looser and plumose. Leaves obovate or elliptical-oblong, obtuse, distinctly petiolate, under  $\frac{1}{2}$  in. long, thick, tomentose on both sides, the midrib prominent underneath. Pedicels solitary, 1. to 2 lines long. Calyx-segments lanceolate or linear, scarcely acute, about 4 lines long, tomentose on both sides, not imbricate. Corolla glabrous, about  $\frac{3}{4}$  in. long, scarcely constricted above the ovary, the tube broad and slightly incurved, the upper lobes small and acute, the lowest not seen perfect. Stamens exserted. Ovary glabrous, rather short, with 2 pairs of ovules in each cell, all very near the base.

**W. Australia.** Sharks Bay, *Milne*.

4. **E. Forrestii**, *F. Muell. Fragm.* vii. 49. A shrub densely covered with a white or yellowish almost floccose tomentum. Leaves opposite or alternate, shortly petiolate, oblong or obovate-oblong, very obtuse, contracted at the base, thick and soft,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long in the specimen. Flowers axillary, on peduncles of 2 to 4 lines. Calyx-segments narrow, not overlapping, almost obtuse, thick and soft, stellate-tomentose, 6 to 7 lines long, not enlarging after flowering. Corolla rather longer than the calyx, minutely tomentose outside, the lobes ovate, mucronate, rather more than 2 lines long, the 2 (upper?) ones rather narrower

than the others and shortly united in an (upper?) lip of the same length as the others and inside in the bud. Stamens included. Ovary glabrous, with 2 superposed pairs of ovules in each cell. Drupe small with a hard putamen, but the only one seen not yet ripe.

**W. Australia.** Lake Barlee, *Forrest* (*Herb. F. Muell.*). Described from a single specimen in which what appeared to be the upper lip of the corolla (but possibly the middle bifid lobe of the lower lip) was certainly inside in the bud, whilst in all Myoporineæ which I have been able to examine in bud I have uniformly found the upper lip outside.

5. **E. ericalyx**, *F. Muell. Fragm. i.* 236. A shrub of 3 or 4 feet, hoary with a close stellate tomentum, the pedicels and calyx thickly covered with a much looser wool consisting of branched hairs. Leaves linear-lanceolate, obtuse, entire, flat or with revolute margins, contracted into a very short petiole, 1 to 2 in. long. Flowers "red," solitary on pedicels shorter than the calyx. Calyx-segments narrow, scarcely imbricate,  $\frac{1}{2}$  in. long. Corolla woolly-pubescent outside, only seen very imperfect. Ovary narrow, glabrous.

**W. Australia.** Murchison river, *Oldfield*. The specimens are very bad, and I have been unable to ascertain the true structure of the ovary or the form of the corolla.

6. **E. Maitlandi**, *F. Muell.* A tall erect shrub, hoary or white all over with a soft dense but close or scarcely floccose tomentum. Leaves linear-lanceolate, entire, contracted at the base but scarcely petiolate, 1 to 2 in. long, coriaceous, hoary-tomentose even when old. Pedicels solitary, about  $\frac{1}{2}$  in. long. Calyx-segments oblong-lanceolate, rather obtuse, not overlapping, 8 to 9 lines long, tomentose outside, more glabrous inside. Corolla broad, above 1 in. long, slightly pubescent outside, the lobes not seen perfect. Ovary acuminate, glabrous, with 2 pairs of ovules in each cell.

**W. Australia.** Sharks Bay, *Maitland Brown, Milne*, the specimens all very imperfect.

SECT. II. EREMOCOSMOS.—Calyx-segments not at all or scarcely overlapping at the base, more or less enlarged veined and scarious after flowering. Ovary with 2 to 4 pairs or in two species with only 1 pair of ovules in each cell. Fruit where known dry, the endocarp separating into distinct pyrenes.

This might be considered as the typical *Eremophila*, and in most species the flowers and fruit are so different from those of *Stenochilus*, that it seems difficult to unite them in one genus, were it not that in other species the several characters are very differently combined. Both the original *Eremophilas* of Brown are exceptional in having but one pair of ovules to each cell of the ovary, and one of them, *E. alternifolia*, in the overlapping calyx-segments and deeply separated lowest corolla-lobe, is closely connected with *Stenochilus*, under which I have classed it, although it has the fruit of *Eremocosmos*. There are too many species in which the ripe fruit is unknown, to admit of its structure being taken at present as an absolute sectional character.

7. **E. rotundifolia**, *F. Muell. Fragm. i.* 207. Hoary with a close tomentum and glandular-tuberculate. Leaves nearly orbicular, or broader than long, 3 to 4 lines diameter, thick, often complicate, with a short recurved, obtuse point, abruptly contracted at the base into a short

broad petiole. Calyx-segments oblong-spathulate or almost obovate, about 5 lines long. Corolla not seen. Unripe fruit hoary-pubescent, oblong, almost perfectly 4-celled, and apparently separable into distinct pyrenes.

**S. Australia.** N.W. interior, *M'Douall Stuart's Expedition*, described from mere fragments in herb. F. Mueller, and of very doubtful affinity.

8. **E. oppositifolia**, *R. Br. Prod.* 518. A small elegant spreading tree of 20 to 30 ft. (*A. Cunn.*), or a tall shrub, quite glabrous or the young shoots hoary or yellowish with a close minute tomentum. Leaves scattered or here and there opposite, linear-lanceolate, acuminate and often ending in a hooked point, contracted into a short petiole, 1 to 2 in. long. Flowers solitary in the axils, on pedicels of 2 to 3 lines. Calyx-segments oblong-spathulate, 6 to 8 lines long, much contracted below the middle. Corolla nearly 1 in. long, glabrous outside and in, the tube incurved, the lobes all short and obtuse, the 2 upper ones more united and the lowest broader than the others. Stamens as long as the corolla, or the longest pair shortly exserted. Ovary shortly villous, with one pair of ovules only in each cell. Fruit not seen quite ripe, but appears either to open in 4 valves leaving the central placenta with 4 pendulous seeds, or to separate into 4 dry cocci, the central placenta at length splitting into 4.—*A. DC. Prod.* xi. 712; *F. Muell. in Proc. R. Soc. Tasm.* iii. 294, and *Rep. Babb. Exped.* 16; *E. arborescens*, *A. Cunn.*; *F. Muell. in Proc. R. Soc. Tasm.* iii. 293; *E. Cunninghamii*, *R. Br. App. Sturt. Exped.* 21; *Eremodendron Cunninghamii*, *A. DC. Prod.* xi. 713.

**N. S. Wales.** Barren wastes near the termination of the Lachlan river, *A. Cunningham*; deserts of the Murray and Darling, *Victorian Expedition*; Mount Murchison, *Bonney*.

**Victoria.** Murray river towards the junction with the Murrumbidgee, *F. Mueller*.

**S. Australia.** Head of Spencer's Gulf, *R. Brown*; Elder's and Flinders' Ranges, *F. Mueller*. Lakes Gregory, Hart, Campbell, &c., *Babbage's Expedition*.

The specific name is unfortunately chosen, for the leaves are usually alternate, and rarely as opposite as in the original imperfect specimens.

9. **E. Paisleyi**, *F. Muell. Rep. Babb. Exped.* 17. Very similar to the narrow-leaved specimens of *E. Mitchellii*, with the same habit and glabrous linear-lanceolate leaves, but the flowers are smaller on very short pedicels and usually several together in axillary clusters as in *Myoporum*. Calyx glandular-pubescent, the segments shortly united at the base and not overlapping, narrow-oblong, obtuse, and 2 lines long at the time of flowering, afterwards enlarged, obovate-oblong, very obtuse and 3 lines long, thin and veined. Corolla about  $\frac{1}{2}$  in. long, pubescent outside, scarcely hairy inside, the tube cylindrical at the base, dilated upwards, the 4 upper lobes ovate, obtuse, about half as long as the tube, the lowest rather longer and twice as broad as the others. Stamens included. Ovary slightly hairy, tapering upwards, with only one pair of ovules in each cell at the top of the rather long cavity. Fruit not seen ripe, but apparently that of the section *Eremocosmos*.

**S. Australia.** Mayerte, Lake Gairdner, *Babbage*. The clustered pedicels are quite exceptional in the genus.



10. **E. Sturtii**, *R. Br. App. Sturt. Exped.* 22. An erect very much branched strong-scented and viscid shrub of several ft., glabrous or very minutely hoary-pubescent. Leaves narrow linear, usually ending in a hooked point, entire, contracted at the base and often petiolate, rarely above 1 in. long. Flowers "purplish," numerous but solitary in each axil, on pedicels of 3 to 4 lines. Calyx-segments obovate or oblong, membranous and rather rigid, obtuse, coloured and veined, rather variable in shape and size but usually attaining 4 or 5 lines when the flowering is over. Corolla pubescent, about  $\frac{1}{2}$  in. long, the narrow base of the tube short, the upper part broadly campanulate, bearded inside, the 4 upper lobes short broad and obtuse, the 2 uppermost more united than the others, the middle lowest lobe larger and broader than the others, notched or 2-lobed and woolly inside. Stamens included. Ovary very villous with 2 or 3 pairs of ovules to each cell. Fruit when young like that of *E. Mitchellii* but not acuminate, not seen quite ripe.—F. Muell. in *Proc. R. Soc. Tasm.* iii. 294 and *Rep. Babb. Exp.* 17.

**N. S. Wales.** Deserts of the Lachlan and Darling to the Barrier Range, *Victorian and other Expeditions*.

**S. Australia.** *Sturt*; between Stoke's Range and Cooper's Creek, *Howitt's Expedition*.

The species scarcely differs from *E. Mitchellii*, except in its smaller flower and narrower leaves.

11. **E. Mitchellii**, *Benth. in Mitch. Trop. Austr.* 31. A tall shrub or small tree of 10 to 30 ft., glabrous viscid and strongly-scented. Leaves linear-lanceolate, obtuse or with a hooked point, entire, contracted into a petiole, 1-nerved, 1 to 2 in. long. Flowers solitary in the axils, on pedicels of 3 to 4 lines. Calyx-segments oblong or cuneate-oblong, obtuse, membranous, veined, glabrous or pubescent on the edges, 4 to 5 lines long. Corolla about  $\frac{3}{4}$  in. long, the cylindrical part of the tube about 2 lines, the broad part above twice as long, the middle lower lobe broader than the others, shortly 2-lobed, woolly inside. Stamens shorter than the corolla. Ovary very woolly, with 3 or 4 superposed pairs of ovules in each cell. Fruit ovoid, almost acuminate, half as long as the calyx, the exocarp thin and membranous, the endocarp separating into 4 nuts each with 1 or with 2 superposed seeds.—F. Muell. in *Proc. R. Soc. Tasm.* iii. 294, and *Rep. Babb. Exped.* 17.

**Queensland.** Elevated stony lands on the Bogan, Narran, Maranoa, Belyando, &c., *Mitchell*; Port Denison, *Fitzalan*, *Dallachy*; Rockhampton, *Thozet* and others; Sutor river, *Fitzalan*, *Sutherland*; Armadilla, *Barton*; Darling Downs, *Lau*.

**N. S. Wales.** Lachlan river, *A. Cunningham*; between the Bogan and Lachlan, *L. Morton*; Castlereagh, *Woolfs*.

12. **E. Clarkii**, *F. Muell. Fragm.* i. 208. An erect shrub, attaining 6 to 8 ft., usually glabrous and often glaucous. Leaves linear or linear-lanceolate, entire or with rather distant serratures, contracted into a short petiole, 1 to 2 in. long. Pedicels solitary or 2 together,  $\frac{1}{2}$  to 1 in. long, spreading and usually incurved and dilated at the end. Calyx-segments broadly lanceolate, acute,  $\frac{1}{2}$  in. long when in flower,

$\frac{3}{4}$  in. or more when in fruit, not at all or scarcely overlapping at the base. Corolla "pale purple," slightly pubescent, above 1 in. long, the tube scarcely constricted above the ovary, broad and slightly incurved, the lobes all broad, the 2 uppermost more united and very obtuse, the lateral ones more acute, the middle lower one broader than the others. Stamens included. Ovary glandular-dotted and very hirsute, with 2 pairs of ovules in each cell. Fruit hirsute with long hairs, ovate, rather acute, much shorter than the calyx, dry and like that of *E. alternifolia*, but not seen quite ripe.

**W. Australia.** Murchison river, *Oldfield*; Sharks Bay, *Maitland Brown*.

**13. *E. Latrobei*, F. Muell. in Proc. R. Soc. Tasm. iii. 294, Rep. Babb. Exped. 17, and Fragm. i. 125, t. 8.** An erect much-branched shrub, attaining 10 ft., more or less clothed with a close hoary minutely stellate tomentum, rarely almost glabrous, usually also glandular-tuberculate. Leaves linear or narrow-lanceolate, flat or with recurved margins, obtuse or rarely acute, entire, contracted into a short petiole,  $\frac{1}{2}$  to 1 in. long or rather more. Pedicels solitary, rarely exceeding  $\frac{1}{4}$  in. Calyx-segments lanceolate, acute, not at all or scarcely overlapping at the base, under  $\frac{1}{2}$  in. long when in flower, attaining sometimes  $\frac{3}{4}$  in. in fruit. Corolla about 1 in. long "spotted," glabrous outside, the tube broad incurved not contracted above the ovary, the lobes almost acute, the 4 upper ones erect and nearly equal, the lowest often shorter and separated to near the middle of the corolla. Stamens exserted. Ovary glabrous, narrow-conical, with 2 pairs of ovules to each cell. Drupe nearly dry, ovoid-conical, 4 to 5 lines long, readily splitting into 2 or 4 at the top, the endocarp sometimes readily separating into 4 nuts. —*E. tuberculata*, F. Muell. in Proc. R. Soc. Tasm. iii. 294.

**N. Australia.** Sturt's Creek and Newcastle Range, *F. Mueller*; between Strangers river and Rupert's Range, *M'Douall Stuart*.

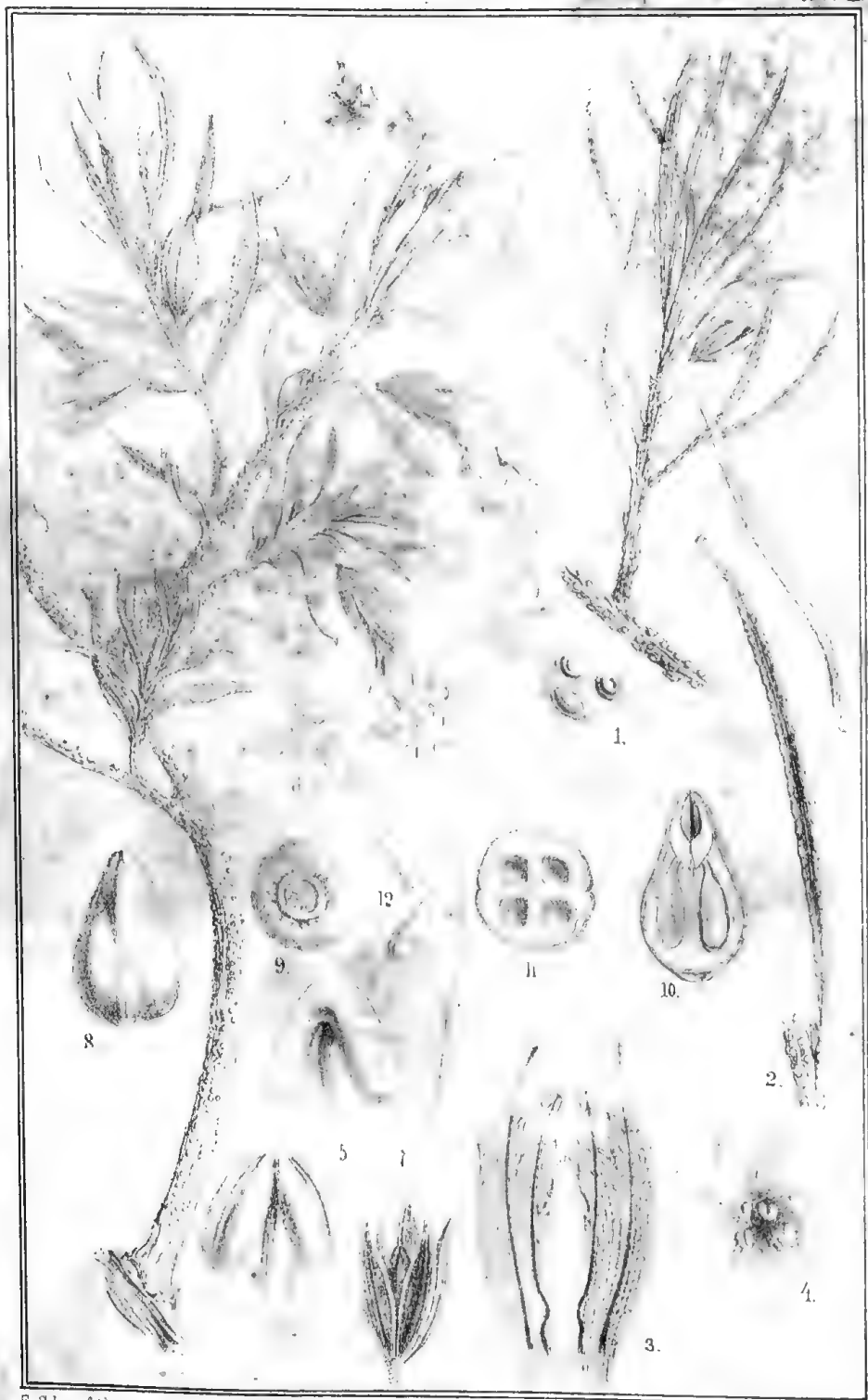
**Queensland.** Suttro, Burdekin, and Mackenzie rivers, *F. Mueller*.

**N. S. Wales.** Darling de-ert, *Barton*, and thence to the Barrier Range, *Victorian and other Expeditions*

**S. Australia.** Cooper's Creek, *Howitt's Expedition*; Thomson river, *A. C. Gregory*; head of the Great Australian Bight, *Dehisser*. The corolla approaches that of *Stenochilus*, but the calyx and fruit are those of *Eremocosmos*.

**SECT. 3. PLATYCALYX.**—Calyx campanulate, divided to the middle only into 5 lobes. Flowers and fruits of *Platyphilus*.

**14. *E. Macdonellii*, F. Muell. Rep. Babb. Exped. 18.** A branching shrub, apparently diffuse, sometimes quite glabrous, more frequently clothed with a hoary or white close stellate or plumose tomentum, or with long spreading hairs, or with both. Leaves oblong-linear or lanceolate, obtuse or acute, contracted at the base but scarcely petiolate, rarely above  $\frac{1}{2}$  in. long. Pedicels solitary,  $\frac{1}{4}$  to above  $\frac{1}{2}$  in. long. Calyx campanulate, with acute or acuminate lobes about as long as the tube, which is sometimes prominently angled and membranous, sometimes more herbaceous and tomentose without prominent ribs, the whole calyx varying from 4 to 8 or even 9 lines long. Corolla "bluish," glabrous outside, 1 to  $1\frac{1}{2}$  in. long, the tube not constricted



F. Schoenfeld del. & lith.

F. Mueller direct.

Hamel & Co. imp.

*Eremophila latrobei*. F.M.



above the ovary and much dilated upwards, the lobes all broad and nearly  $\frac{1}{2}$  in. long, the upper ones more united, the three lower more spreading, the lowest rather broader than the others but not notched. Stamens included. Ovary narrow, glandular-dotted and tipped with a few hairs, with 2 pairs of ovules in each cell. Fruit very succulent, ovoid-globose, acute, not seen ripe but already as long as the somewhat enlarged calyx.

**S. Australia.** Cooper's Creek, *Wright*; Wills Creek, *Howitt's Expedition*; Lake Gregory and other parts of the interior, *Babbage's and M'Douall Stuart's Expeditions*; towards Spencer's Gulf, *Warburton*.

The calyx of this species is exceptional in the whole Order of Myoporinæe.

**SECT. 4. PLATYCHILUS.**—Calyx-segments much imbricate at the base (except in the first two species) the outer ones usually broader. Corolla-lobes all broad and obtuse or the upper ones scarcely acute. Stamens included or scarcely exerted. Ovules in two or three superposed pairs in each cell of the ovary. Fruit (of *Stenochilus*) succulent, with a thick bony putamen, not separating into pyrenes.

15. **E. graciliflora**, *F. Muell. Fragm.* i. 208. A shrub of several feet, the young shoots more or less hoary-tomentose, the adult leaves usually glabrous. Leaves linear-lanceolate, acutely acuminate and the points sometimes incurved, quite entire, contracted into a petiole, 1 to  $2\frac{1}{2}$  in. long. Pedicels solitary, under  $\frac{1}{2}$  in. long. Calyx-segments linear-lanceolate, not overlapping at the base, scarcely exceeding 3 lines when in flower, broader 6 to 8 lines long and acute when in fruit. Corolla "red," more slender than in most species, scarcely incurved, under 1 in. long, sprinkled with short spreading hairs, the tube not contracted above the ovary, gradually but not much enlarged upwards, the lobes nearly equal, oval-oblong, obtuse, the 2 upper ones rather more united than the others. Stamens included; anther-cells narrow. Ovary oblong, glandular-dotted, glabrous, with 2 pairs of ovules in each cell. Drupe small, dry, depressed-globular, the putamen hard.

**W. Australia.** Murchison river, *Oldfield*.

16. **E. longifolia**, *F. Muell. in Proc. R. Soc. Tasm.* iii. 295. A tall erect shrub, the young shoots minutely hoary-tomentose, the older foliage nearly glabrous and often drying black. Leaves scattered, linear or almost linear-lanceolate, obtuse or tapering into a recurved point, rather thick but flat, 2 to 4 or even 5 in. long, contracted into a short petiole. Pedicels solitary or 2 together, varying in length from 2 or 3 lines to  $\frac{1}{2}$  in., stout or slender, erect or spreading. Calyx-segments triangular or lanceolate, acute or acuminate, rarely 2 lines long, united at the base and scarcely overlapping, usually woolly-ciliate on the margins. Corolla velvety-pubescent outside,  $\frac{3}{4}$  to 1 in. long, the tube gibbous at the base, contracted over the ovary, the remainder much dilated and slightly incurved, the lobes all ovate and obtuse the two uppermost rather smaller and the lowest often but not always more deeply separated than the others. Stamens shortly exerted. Ovary thick and fleshy, with 2 pairs of ovules in each cell. Fruit ovoid or

globular, very succulent, with a thick hard putamen, completely 4-celled and not separating into pyrenes.—*Stenochilus longifolius*, R. Br. Prod. 517 and App. Sturt. Exped. 23; A. DC. Prod. xi. 714; *S. salicinus*, Benth. in Mitch. Trop. Austr. 251 and *S. pubiflorus*, Benth. l. c. 273.

**N. Australia.** Sturt's Creek, *F. Mueller*; in the interior, *M'Douall Stuart's Expedition*.

**Queensland.** Sattor river, *F. Mueller*, *Bowman* (the latter with smaller flowers and fruit), *Sutherland*; Belyando river, *Mitchell*; Arnadilla, *Barton*; Darling downs, *Lau*.

**N. S. Wales.** Lachlan river to Liverpool Plains and all the brushes of the interior, *A. Cunningham*, *Fraser*; from the Murray and Darling to the Barrier Range, *Victorian and other Expeditions*.

**Victoria.** Murray and Avoca rivers, and Lake Hindmarsh, *F. Mueller*; Wimmera, *Dallachy*.

**S. Australia.** Spencer's Gulf, *R. Brown*; S. coast, *Sturt*; N. of Adelaide, *Whitaker*.

**W. Australia.** Swan river, *Drummond*; Murchison river, *Oldfield*.

17. **E. Drummondii**, *F. Muell. Fragm.* vi. 147. An erect, virgate, much-branched shrub, glabrous and more or less glutinous. Leaves alternate, linear-filiform, obtuse or with a short straight or incurved point, usually about 1 in. but sometimes nearly 2 in. long. Pedicels solitary or 2 together, often above  $\frac{1}{2}$  in. long. Calyx-segments very much imbricate, lanceolate or ovate-lanceolate, acute, nearly 3 lines long. Corolla glabrous outside, incurved, 7 to 9 lines long, the cylindrical base short, the broad part of the tube much longer, the four upper lobes almost acute, the middle lower one broader than the others, very obtuse, pubescent inside at the base. Stamens included. Ovary glabrous, 2-celled, with 2 pairs of ovules in each cell. Young fruit oblong-conical, nearly as long as the calyx, the putamen almost perfectly 4-celled, with 1 seed in each cell.

**W. Australia.** *Drummond*, n. 64, with rather broad calyx-segments, and n. 74 with the segments still broader, almost ovate.

18. **E. polyclada**, *F. Muell. in Proc. R. Soc. Tasm.* iii. 294. A glabrous shrub of 4 to 8 feet, with very divaricate rigid intricate branches, the smaller ones almost spinescent, the specimens usually drying black. Leaves mostly very spreading, distant, linear or narrowly linear-lanceolate, acute, entire, narrowed at the base, 1 to 2 in. long. Pedicels solitary, often recurved, 2 to 4 lines long. Calyx-segments much imbricate, broad, obtuse or acuminate, with spreading or recurved points. Corolla glabrous outside,  $\frac{3}{4}$  to 1 in. long, the tube broad, almost campanulate, gradually enlarged from the base and not contracted above the ovary, the lobes all very broad, the 2 upper ones more united and the middle lower one twice as broad as the others and emarginate, the whole corolla bearded inside especially under the upper lobes. Stamens scarcely exerted from the tube, shorter than the lobes. Ovary oblong, glabrous, with 2 pairs of ovules to each cell. Fruit tapering into a beak exceeding the calyx, but not seen quite ripe.—*Pholidia polyclada*, *F. Muell. in Hook. Kew Journ.* viii. 201, and in *Trans. Phil. Soc. Viet.* i. 47.

**Queensland.** Desert on the Suttor, *F. Mueller, Sutherland; Cape river, Bowman; Curriwillighie, Dalton.*

**N. S. Wales.** Darling and Murray desert, *F. Mueller, Victorian and other Expeditions.*

**S. Australia,** Great marsh of the interior, *Sturt.*

The species is nearly allied to *E. bignoniflora*, differing chiefly in the narrow leaves and tapering ovary and fruit.

19. ***E. bignoniflora*,** *F. Muell. in Proc. R. Soc. Tasm.* iii. 294 and *Pl. Vict.* ii. t. 55. A strong-scented tall shrub or small tree, quite glabrous and often glutinous. Leaves lanceolate or linear-lanceolate, acuminate, entire, contracted into a short petiole, 2 to 6 in. long. Pedicels solitary,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long, more or less flattened, often recurved, but not turned up again. Calyx-segments imbricate at the base, ovate, obtuse or rarely acute, thickened in the middle, 2 to 3 lines long. Corolla glabrous outside, about 1 in. long, scarcely contracted above the ovary, the tube gradually enlarged from the base, the lobes all broad and short, the 2 uppermost more united, the lowest twice as broad as the others and 2-lobed. Stamens shortly exserted from the tube but shorter than the corolla-lobes. Ovary 2-celled with 2 pairs of ovules to each cell. Drupe ovate, acute,  $\frac{1}{2}$  in. long or more, succulent, the putamen hard and bony, more or less completely 4-celled.—*Stenochilus bignoniflorus*, Benth. in *Mitch. Trop. Austr.* 386.

**N. Australia.** Sturt's Creek and Gilbert river, *F. Mueller.*

**Queensland.** Balonne river, *Mitchell; Suttor river, Bowman, Sutherland; Rockhampton, Herb. F. Mueller.*

**N. S. Wales.** Murray and Darling desert, *Dallachy and Goodwin.*

**Victoria.** Murray desert, *Irvine.*

20. ***E. Freelingii*,** *F. Muell. in Proc. R. Soc. Tasm.* iii. 295. An erect shrub, more or less hoary-tomentose and glutinous or the foliage at length glabrous. Leaves crowded, lanceolate, acute, entire, contracted into a rather long petiole,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long. Peduncles solitary, mostly 2 to 3 lines long. Calyx-segments much imbricate, ovate or lanceolate, rather acute or acuminate, not dilated upwards, the outermost usually much broader and larger than the inner ones. Corolla above 1 in. long, pubescent outside, the tube constricted above the ovary, then enlarged, the 4 upper lobes rather broad and acute, the 2 uppermost more united than the others, the middle lower lobe broader and obtuse. Stamens included. Ovary ovoid, with 2 or 3 pairs of ovules in each cell, suspended from short broad flat erect superposed funicles. Drupe not seen perfect, apparently nearly dry, with a 4-celled putamen.

**S. Australia.** Lake Torrens, *Howitt's Expedition; between Stoke's Range and Cooper's Creek, Wheeler* (both with the calyx 2 to 3 lines long); near Lake Torrens, *Haucker in Freeling's Expedition* (with the outer calyx-segments above  $\frac{1}{2}$  in. long, and the corolla also large).

21. ***E. Goodwinii*,** *F. Muell. Rep. Babb. Exped.* 17. A shrub of several feet, more or less glandular and viscid and often hirsute with spreading hairs which are rarely wanting on the calyxes and pedicels. Leaves linear or linear-lanceolate, acutely acuminate, entire, scarcely

contracted or even dilated at the base and sessile, the midrib often very prominent underneath, mostly 1 to nearly 2 in. long. Pedicels solitary,  $\frac{1}{2}$  to 1 in. long or even more. Calyx-segments much imbricate, lanceolate, very acute, 4 to 8 lines long, the outer one usually broader and the 2 innermost smaller than the others. Corolla more or less pubescent outside,  $\frac{3}{4}$  to above 1 in. long, the lobes broad, obtuse or shortly acute, the 2 uppermost more united, the middle lowest lobe scarcely broader than the others. Stamens included. Ovary shortly ovoid, very hairy, with 2 pairs of ovules in each cell. Fruit very obtuse or retuse, hairy, 4 to 5 lines long, very thick with a thick bony 4-celled putamen.

**N. S. Wales.** Darling river and Mount Murchison, *Dallachy and Goodwin*.

**S. Australia.** N.W. interior, Mount Freeling, &c., *M'Douall Stuart's Expedition*; between Stoke's Range and Cooper's Creek, *Wheeler*.

22. **E. Willsii**, *F. Muell. Fragm.* iii. 21, t. 20. Branches and foliage more or less covered with a glandular rust-coloured pubescence and somewhat glutinous. Leaves obovate-oblong, obtuse or almost acute, entire or serrulate, contracted at the base but not petiolate, about 1 in. long. Pedicels solitary, hispid, short. Calyx-segments much imbricate,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long and enlarging after flowering, the outermost almost ovate, the innermost narrow, all acute. Corolla glabrous, or slightly pubescent outside, "blue," the lobes all broad obtuse or very shortly acute, the middle lower one rather broader than the others. Stamens included. Ovary narrow, densely tomentose, with 2 pairs of ovules in each cell. Fruit not seen.

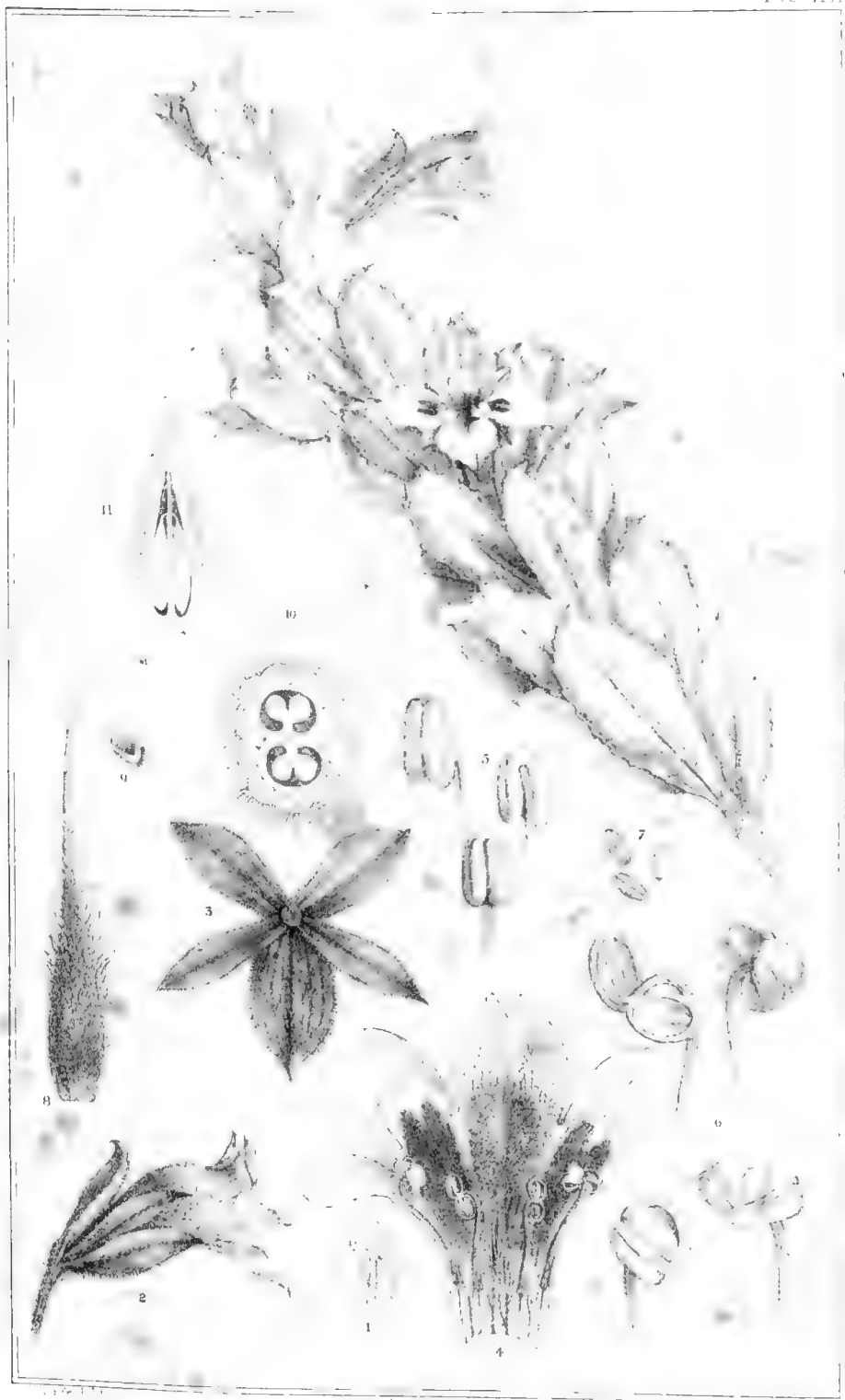
**N. Australia.** Finke river, *M'Douall Stuart's Expedition*.

23. **E. platycalyx**, *F. Muell. Fragm.* v. 109. A shrub of about 10 feet, more or less hoary-tomentose or almost glabrous, the branches often glandular-verrucose. Leaves lanceolate, broad or narrow, tapering into a short petiole, entire and rather thick, above 1 in. long. Calyx-segments much imbricate, almost like those of an *Ipomœa*, oval-oblong in the bud rather thick and very obtuse, but as the flower expands very soon enlarging, almost orbicular, thin, coloured and veined, attaining  $\frac{1}{2}$  in. diameter. Corolla glabrous outside, above 1 in. long, the tube broad, slightly constricted above the ovary, the lobes all broad. Stamens included. Ovary oblong, tapering upwards, slightly glandular-tomentose or glabrous, with 2 pairs of ovules in each cell.

**W. Australia.** *Drummond*; Sharks Bay and 300 miles up Murchison river, *Maitland Brown*.

24. **E. viscida**, *Endl. Nov. Stirp. Dec.* 51. Glabrous and glutinous. Leaves elliptical-lanceolate, entire,  $1\frac{1}{2}$  to 2 in. long, 4 to 5 lines broad. Peduncles solitary or 2 together, 5 lines long; dilated under the flowers. Calyx-segments obovate, obtuse, enlarged scarious and veined when in fruit and then 5 lines long and 4 broad. Corolla-tube broad, 5 lines long, the lobes all broad obtuse 3 lines long, the 2 uppermost more united in an upper lip. Stamens much exserted. Drupe small.—*DC. Prod.* xi. 712; *F. Muell. in Proc. R. Soc. Tasm.* iii. 294.





*Eremophila Willsii*. F.W.



**W. Australia.** *Roe.* I have not examined this species; from the above description abridged from Endlicher's it appears to be near *E. platycalyx*, but with long exserted stamens. The only specimen I have seen (in the Herbarium of the Imperial Botanic Garden at Vienna) has no corolla.

**SECT. 5. STENOCHILUS.**—Calyx-segments imbricate at the base, usually enlarged after flowering. Corolla 4 upper lobes short and acute, the fifth lowest more deeply separated and sometimes narrow. Stamens exserted (except in *E. alternifolia*). Ovules 2 or 3 pairs or rarely only 1 pair in each cell of the ovary. Drupe usually succulent, with a thick bony putamen not separating into pyrenes.

**25. E. Brownii**, *F. Muell. in Proc. R. Soc. Tasm.* iii. 297. A shrub attaining sometimes several feet, rarely quite glabrous, more frequently with the branches and young shoots and sometimes the adult foliage hoary or white with a close almost mealy tomentum. Leaves lanceolate or rarely elliptical oblong or cuneate, obtuse or acute, entire or very rarely marked with a few serratures, contracted into a petiole, very variable in size, most frequently  $\frac{3}{4}$  to 1 in. long, but in some specimens all under  $\frac{1}{2}$  in. and crowded. Pedicels solitary, usually shorter than the calyx. Flowers "yellow, red, or with these colours variously mixed." Calyx-segments imbricate, broadly or narrowly lanceolate, acuminate or almost obtuse, varying from scarcely above 1 line to above 3 lines long, the outer ones usually larger than the inner. Corolla glabrous or slightly pubescent outside, usually about 1 in. but in some specimens only 8 or 9 lines long, the tube constricted above the ovary, then dilated and incurved, the 4 upper lobes short narrow and acute, with sometimes an accessory one between the 2 uppermost, the lowest lobe narrow, rolled back, separated to about the middle of the corolla. Stamens exserted, usually long. Ovary with 2 pairs of ovules to each cell. Fruit ovoid or almost globular, succulent, 4 to 5 lines diameter when perfect, the putamen hard, almost perfectly 4-celled with 1 seed in each cell.—*Stenochilus glaber*, *R. Br. Prod.* 517; *A. DC. Prod.* xi. 714; *Endl. Iconogr.* t. 92; *Bot. Mag.* t. 1942; *Bot. Reg.* t. 572; *S. viscosus*, *Grah.* in *Edinb. Phil. Journ.* vi. 387 and in *Bot. Mag.* t. 2930; *A. DC. Prod.* xi. 715; *Eremophila Grahmi*, *F. Muell. in Proc. R. Soc. Tasm.* iii. 297; *S. ochroleucus* *A. Cunn. (S. maculati* var. *A. DC.), A. DC. Prod.* xi. 715; *S. albicans* and *S. subcanescens* *Bartl.* in *Pl. Preiss.* i. 351; *A. DC. l. c.*; *Eremophila albicans*, *F. Muell. in Proc. R. Soc. Tasm.* iii. 297; *S. incanus*, *Lindl. Bot. Reg.* 1839, Misc. 70; *Eremophila incana*, *F. Muell. in Proc. R. Soc. Tasm.* iii. 297.

**Queensland.** Between Warrego and the Maranoa, *Barton*.

**N. S. Wales.** Lachlan river, Peel's Range, &c., *A. Cunningham*; from the Lachlan, Murray, and Darling to the Barrier Range, *Victorian and other Expeditions*.

**Victoria.** Murray desert, *F. Mueller*; Wimmera, *Dallachy*.

**S. Australia.** Fowler's Bay, and head of Spencer's Gulf, *R. Brown*, from the Murray to St. Vincent's and Spencer's Gulf, and Lake Torrens *F. Mueller* and others; Kangaroo island, *Waterhouse*; Lake Gairdner, *Babbage*.

**W. Australia.** From Swan river to the northward, *Drummond*, 1st coll. n. 441, 442, *Preiss.* n. 2303, 2304, 2318, *Fraser* and others; Murchison river, *Oldfield*; Sharks Bay, *Milne*, *Maitland Brown*; Phillips and Fitzgerald river, *Maxwell*.

This the typical *Stenochilus* from which the following species diverge more or less,

connecting it with the other sections of *Eremophila*, is itself exceedingly variable, from cottony white all over to perfectly glabrous, as well as in the shape of the leaves and size of the leaves and flowers. The following appears almost deserving to be reckoned a distinct species:—

Var. *viridiflora*, F. Muell. Diffuse, with small crowded leaves and small flowers, viscid, pubescent and green. The lower lobe smaller than in the typical form. W. Australia, *Drummond*, (2nd coll. ?) n. 162; Upper Kalgan river, F. *Mueller*.

26. **E. subfloccosa**, Benth. Young shoots thickly covered with a loose plumose almost floccose tomentum, wearing off from the older leaves. Leaves crowded, elliptical-oblong, obtuse, entire, contracted at the base but sessile or nearly so,  $\frac{1}{2}$  in. long or rather more, rather thick, the older ones apparently glutinous. Flower solitary, sessile or nearly so, longer than the leaves. Calyx-segments much imbricate, narrow, acute, loosely tomentose, 3 lines long or rather more, the outer ones linear-lanceolate, the inner narrow-linear. Corolla glabrous outside or sprinkled with short hairs, 7 to 8 lines long, slightly constricted above the ovary, then incurved and enlarged, the 4 upper lobes small and acute, the lowest one much shorter, also acute. Stamens exserted. Ovary glabrous, with only one pair of ovules in each cell.

**W. Australia.** In the interior, *Roe*, also *Drummond* (in herb. F. *Muell*.)

27. **E. Oldfieldii**, F. *Muell. Fragm.* i. 208. An erect shrub of several feet, or small tree of 10 feet (*Oldfield*), glabrous and probably glutinous, or the branchlets and young shoots minutely hoary. Leaves linear or lanceolate, acute or almost obtuse, entire, contracted into a petiole, flat but rather thick, 1 to 2 in. long or rarely more. Flowers "red with a yellow base," solitary, on pedicels of  $\frac{1}{4}$  to  $\frac{1}{2}$  in. Calyx-segments much imbricate, oblong, from almost cuneate to lanceolate, obtuse or acute, 3 to 4 lines long at the time of flowering, enlarging to  $\frac{1}{2}$  in. or more. Corolla glabrous outside or nearly so, about  $\frac{3}{4}$  in. long, the tube broad from the base and scarcely constricted above the ovary, the lobes all obtuse or scarcely acute, the 4 upper ones short, the lowest broadly oblong and separate to near the middle of the corolla. Stamens more or less exserted. Ovary short, obtuse, glabrous, with 2 or 3 pairs of ovules in each cell.

**W. Australia.** Murchison river, *Oldfield*; Sharks Bay, *Milne*.

28. **E. Duttoni**, F. *Muell. Rep. Babb. Exped.* 16. An erect glutinous shrub, glabrous or the young shoots slightly tomentose. Leaves narrow-lanceolate, entire, tapering into a long acute point, contracted at the base but scarcely petiolate, 1 to 2 in. long. Pedicels solitary,  $\frac{1}{2}$  in. long or more, very spreading and turned up towards the end. Flowers "orange-red." Calyx-segments ovate, acute or acuminate, and 4 to 6 lines long at the time of flowering, afterwards often enlarged, broad, coloured, almost scarious and veined. Corolla usually glabrous outside, slightly bearded inside, 1 to  $1\frac{1}{2}$  in. long, the tube constricted above the ovary, then enlarged and slightly curved, the 4 upper lobes short and acute, the lowest oblong, obtuse, separate to about  $\frac{1}{3}$  of the corolla. Stamens exserted. Ovary glabrous or slightly glandular-pubescent, with a pair of ovules to each cell. Fruit suc-

culent, shining, shorter than the enlarged calyx, the putamen hard and bony, usually 4-celled, with one seed in each cell.

**N. S. Wales.** Near the Barrier Range, *Victorian Expedition*; Mount Murchison, Bonney.

**S. Australia.** Cooper's Creek, *Wright*; Northern interior, *M'Douall Stuart*.

29. **E. maculata**, *F. Muell. in Proc. R. Soc. Tasm.* iii. 297. A tall shrub, with rigid divaricate branches, more or less hoary-tomentose or pubescent, the adult foliage usually glabrous. Leaves mostly lanceolate, varying however from elliptical-oblong to linear, acute or obtuse, entire, contracted into a petiole, rarely above 1 in. long, flat and green on both sides or hairy when young. Pedicels solitary, often above  $\frac{1}{2}$  in. long, very spreading or reflexed but turned up again under the flowers. Calyx-segments much imbricate and ovate at the base, acuminate, 2 to 3 lines long or more. Corolla glabrous outside, "red, more or less variegated with yellow or quite yellow," 1 in. long or more, the broad tube constricted above the ovary, the upper part slightly incurved and not much dilated, the 4 upper lobes short and acute, the lowest one narrow, recurved, separated to below the middle of the corolla. Stamens usually but perhaps not always exserted. Ovary glabrous, with 2 or 3 pairs of ovules to each cell. Fruit ovoid-globular, shortly acuminate, above  $\frac{1}{2}$  in. diameter, very succulent, with a hard bony putamen, completely 2-celled and less perfectly 4-celled. Seeds small, without so much albumen as in some species.—*Stenochilus maculatus*, Ker. in Bot. Reg. t. 647; R. Br. App. Sturt. Exped. 23; *S. racemosus* Endl. Nov. Stirp. Dec. 50; A. DC. Prod. xi. 715; *S. curvipes*, Benth. in Mitch. Trop. Austr. 221.

**N. Australia.** Attack Creek, *M'Douall Stuart's Expedition*.

**Queensland.** Warrego river, *Mitchell*; Isaacs and Fitzroy rivers, *Bowman and others*; Curriewillighie, *Dalton*; Darling Downs, *Lau*.

**N. S. Wales.** Lachlan river, *A. Cunningham*; Murray, Darling, and Lachlan rivers to the Barrier Range, *Victorian and other Expeditions*; Junction of the Murray and Murrumbidgee, *F. Mueller*.

**Victoria.** Murray river, *F. Mueller*.

**S. Australia.** Murray river towards Moriunda, *F. Mueller*.

Var. *brevifolia*. Leaves oblong or obovate-oblong, very obtuse, mostly about  $\frac{1}{2}$  in. long.

**N. Australia.** Hammersley Ranges, N.W. coast, *Maitland Brown*.

**N. Australia.** Murchison river, 300 miles above the Geraldine, *Oldfield*; 100 miles E. of York, *Roe*.

30. **E. denticulata**, *F. Muell. Fragm.* i. 125. A shrub of several feet, glabrous or nearly so and glutinous. Leaves lanceolate ovate-lanceolate or oblong-elliptical, acute or acuminate, entire or serrulate, contracted into a rather long petiole, 1 to 2 in. long. Pedicels solitary,  $\frac{1}{2}$  to 1 in. long, very spreading and incurved under the flowers. Calyx-segments much imbricate at the base, lanceolate or ovate-lanceolate, acute or acuminate, 2 to 4 lines long. Corolla "red," glabrous outside, about 1 in. long, slightly constricted above the ovary, but broad even there, and enlarged and incurved upwards, the 4 upper lobes very small and acute, the lowest lobe narrow, recurved, separated to below the middle of the corolla. Stamens exserted. Ovary rather short,

ovoid, glabrous, with only one pair of ovules to each cell. Drupe succulent, but not seen ripe.

**W. Australia**, *Drummond*; Phillips river and sand hummocks, Eyre's Relief, *Maxwell*.

**31. *E. latifolia***, *F. Muell. in Linnea*, xxv. 428, and in *Proc. R. Soc. Tasm.* iii. 293. A spreading shrub of 2 to 3 ft., the young shoots slightly hoary-pubescent, otherwise glabrous and usually glutinous. Leaves ovate obovate or ovate-lanceolate, obtuse, mostly denticulate and often undulate, contracted into a rather long petiole,  $\frac{1}{2}$  to 1 in. long. Pedicels solitary, slender, above  $\frac{1}{2}$  in. long, very spreading and curved upwards at the end. Calyx-segments much imbricate, broadly ovate or obovate, obtuse, herbaceous, 3 to 4 lines long when in flower, enlarging sometimes to 4 or 5 lines, very broad rigid and veined when in fruit, the outermost one often smaller than the others. Corolla glandular-pubescent outside,  $\frac{3}{4}$  to 1 in. long, slightly constricted above the ovary, then broad and incurved; the 4 upper lobes short and acute, the lowest narrow, reflexed, separated to below the middle of the corolla. Stamens exserted. Ovary depressed, 2-celled, with only one pair of ovules to each cell. Fruit depressed-globular, half as long as the calyx, succulent, with a hard bony almost completely 4-celled putamen.—*Stenochilus serrulatus*, *A. Cunn.* in *DC. Prod.* xi. 715.

**N. S. Wales**. Peel's Range, *A. Cunningham*; Lachlan and Darling rivers to the Barrier Range, *Victorian and other Expeditions*.

**S. Australia**. Near Cudnaka, *F. Mueller*; Lake Gillies, *Burkitt*; N. interior, *M'Donnell Stuart's Expedition*.

**W. Australia**, *Drummond*, *Harper*.

**32. *E. alternifolia***, *R. Br. Prod.* 518 and *App. Sturt. Exped.* 22. A tall erect much-branched shrub, the young shoots minutely hoary, otherwise glabrous. Leaves scattered, linear-terete, usually ending in a recurved point, entire, contracted into a short petiole, rarely above 1 in. long. Pedicels solitary, very spreading or reflexed but turned up at the end. Calyx-segments much imbricate, ovate or almost orbicular, scarious, veined, coloured, the inner ones 3 to 4 lines long, the 2 outer ones smaller. Corolla "red, spotted with purple," glabrous outside,  $\frac{3}{4}$  to 1 in. long, the short base of the tube almost globular, constricted above the ovary, then dilated and somewhat incurved; the 4 upper lobes short and acute, the lowest lobe broader, obtuse, very spreading and separated to the middle of the tube. Stamens included. Ovary glabrous, with only one pair of ovules to each cell. Fruit ovoid or ovoid-conical, the exocarp very thin, the endocarp readily separating into 4 acuminate pyrenes, with 1 seed in each.—*A. DC. Prod.* xi. 712; *F. Muell.* in *Proc. R. Soc. Tasm.* iii. 294.

**N. S. Wales**. Darling river, *Giles*.

**S. Australia**. Spencer's Gulf, *R. Brown*, *Warburton*; Murray Scrub, *Behr*; Flinders' Range and Lake Torrens, *F. Mueller*; Lake Gillies, *Burkitt*; Lake Gairdner, *Babbage's Expedition*.

This species has the calyx and corolla of *Stenochilus*, with the included stamens and the fruit of *Eremocosmos*.

Var. *latifolia*, *F. Muell.* Leaves thick and nerveless, but flat, and 1 to  $1\frac{1}{2}$  lines broad.—Head of the Great Bight, *Delisser*.











## ORDER XCI. SELAGINEÆ.

Flowers irregular. Calyx persistent, more or less deeply toothed or divided into 3 to 5 lobes, or into 2 or 3 distinct sepals. Corolla with 4 or 5 lobes more or less obliquely declinate or rarely 2-lipped. Stamens usually 4, in pairs, inserted at the summit of the tube of the corolla and alternating with its lower lobes; anthers 1-celled (by the confluence of the 2 cells?) Ovary free, not lobed, 2-celled with 1 pendulous ovule in each cell. Style simple, undivided at the apex. Fruit small, dry, readily separating into two 1-seeded nuts or reduced to a single one by abortion. Seeds pendulous, albuminous; embryo straight, with a superior radicle.—Herbs or undershrubs usually small. Leaves alternate or rarely opposite, the floral ones often dissimilar and reduced to bracts. Flowers solitary within each floral leaf, usually sessile, forming dense or interrupted terminal spikes.

A small extratropical Order, chiefly South African, with one northern genus, the only Australian species having been probably introduced from the Cape. The order is closely allied to and forms as it were the S. African representative of the Australian Myoporineæ, differing more in habit than in any positive character except the reduction of the ovules to one only or two in the whole ovary, which appears to be constant in Selagineæ, and only occurs in a very few species of Myoporineæ. The irregularity of the corolla assumes also a somewhat different type in the two Orders.

## \*1. DISCHISMA, Chois.

Calyx divided to the base into 2 sepals. Corolla with a cylindrical tube, the limb obliquely declinate (1-lipped). Stamens 4.

\*1 **D. capitatum**, Chois. in *Mem. Soc. Gen. and in DC. Prod.* xii. 7. A diffuse small but hard branching annual, more or less hirsute or sprinkled with crisped hairs. Lower leaves opposite, the upper ones alternate, linear with a few distant teeth or entire, mostly about or under  $\frac{1}{2}$  in. long. Flowers small (blue?), in terminal spikes which after flowering become very dense, ovoid or oblong, and from  $\frac{1}{2}$  to above 1 in. long, each flower sessile within a floral leaf or bract, broad at the base with a linear herbaceous point longer than the flower, and after flowering the broad bases of the bracts are closely imbricated concealing the fruit. Sepals small very thin and ciliate (not  $\frac{1}{2}$  line long). Corolla tube about 1 line long, the upper lip almost obsolete, the lower as long as the tube, with small lateral lobes and a larger lower one. Fruit oblong, about 1 line long, separating into 2 narrow nuts.

**W. Australia.** *Drummond, 2nd coll. n. 150, 3rd. coll. n. 292*; apparently abundant, as numerous specimens were gathered each time, but most likely introduced from the Cape where the species is not uncommon.

## ORDER XCII. VERBENACEÆ.

Flowers irregular or rarely regular. Calyx persistent, truncate toothed or lobed. Corolla with 4 or 5, rarely 6 to 8, lobes or rarely

truncate, the lobes more or less 2-lipped or nearly or quite equal, imbricate in the bud, the upper lip or uppermost lobe or sometimes the lateral ones outside. Stamens inserted in the tube of the corolla, usually 4 in pairs or nearly equal and alternating with its lower lobes, or when the corolla is regular 4 to 8 alternating with its lobes. Anthers 2-celled, the cells opening longitudinally and usually parallel. Ovary not lobed or only shortly 4-lobed, usually more or less perfectly divided into 2 or 4 cells or half-cells, with 1 ovule in each cell or half-cell, either anatropous and erect from the base, or more or less amphitropous and attached laterally or near the top so as to appear pendulous. Style terminal, simple, entire or more frequently with 2 short stigmatic lobes. Fruit dry or more or less drupaceous, the whole fruit or the endocarp separating into 2 or 4 nuts or pyrenes or quite indehiscent and 2- or 4-celled, and sometimes with an additional central cavity between the carpels having the appearance of a third or fifth empty cell. Seeds solitary in each cell half-cell or pyrene, erect, with or without albumen, the testa usually membranous. Embryo straight, with thick cotyledons and an inferior radicle.—Herbs shrubs trees or woody climbers. Leaves opposite whorled or rarely alternate, without stipules, entire toothed or divided. Inflorescence various.

A large Order, ranging over both the New and the Old World, most abundant within the tropics, but with several extratropical species, both in the northern and southern hemispheres. Of the twenty Australian genera, three are large American ones of which a very few species, including those found in Australia, have become more or less generally diffused over the Old World, five are most numerously represented in tropical Asia and Africa, but three of them are also American, and one of these extends in a single species beyond the tropics as far as southern Europe, one, consisting chiefly of maritime plants, is as common in the New as in the Old World, and the remaining eleven genera are purely endemic, with the exception of *Faradaya*, which is represented by a second species in the South Pacific Islands.

The structure of the flower in Verbenaceæ has been considerably elucidated in several points by the observations of H. Bocquillon (Revue du groupe des Verbénacées, Paris, 1861-1863), but his arrangement of the genera appears to me to be neither natural nor practical, removing as it does for instance *Olerodendron* far from *Premna*, to place it next to *Priva*, which again is placed at some distance from *Verbena*, and in a totally different group from *Stachytarpheta*. The regularity or irregularity of the flower is in some cases not well marked, nor sufficiently in accord with other characters to serve as a basis for the primary division of the Order, and the degree in which the placental margins of the carpellary leaves protrude into the cavity of the ovary, meeting only or cohering in the centre, thus more or less completely dividing it into cells, is, in this Order, a difference of degree only, the placentation never having the truly parietal character of that of Gesneriaceæ. I have therefore returned to the old division of the Order into the main tribes adopted by Schauer in the Prodröm, with some minor modifications as to a few genera which had been imperfectly known or incorrectly described.

**TRIBE 1. Verbenææ.**—Ovules ascending from the base of the cells. Flowers in racemes or spikes sometimes contracted into heads, solitary within each bract, without bracteoles.

Ovary 2-celled, with 1 ovule in each cell. Spikes dense, usually contracted into heads.

Fruit a drupe . . . . . 1. LANTANA.

Fruit dry, separating into small nuts . . . . . 2. LIFFIA.

Ovary 4-celled, with one ovule in each cell. Spikes elongated . . . . . 3. VERBENA.

TRIBE 2. **Viticeæ**.—Ovules laterally attached above the base or near the top. Flowers in cymes or if solitary or in spikes usually accompanied by 2 bracteoles besides the subtending bract or leaf.

SUBTRIBE 1. **Chloantheseæ**.—Ovary not lobed. Fruit small, dry, or rarely drupaceous. Shrubs or herbs usually very cottony or woolly, rarely nearly glabrous, glutinous or resinous. Seeds where known always albuminous.

Corolla small, regular or nearly so. Stamens isomerous.

Style entire or minutely 2-lobed. Flowers in dense woolly spikes.

Flowers 5-8-merous. Corolla truncate or very shortly lobed . . . . . 4. LACHNOSTACHYS.

Flowers 5-merous. Corolla distinctly lobed . . . . . 5. NEWCASTLIA.

Flowers 4-merous. Corolla distinctly lobed . . . . . 6. PHYSOPSIA.

Style rather shortly 2-lobed. Flowers 4-merous in heads or corymbs . . . . . 7. MALLOPHORA.

Style deeply 2-lobed. Flowers 5-merous in heads cymes or panicles . . . . . 8. DICRASTYLES.

Corolla more or less 2-lipped, or unequally 5 lobed. Stamens 4.

Leaves decurrent. Corolla-tube elongated. Anthers without appendages . . . . . 9. CHLOANTHES.

Leaves not decurrent. Corolla-tube broad. Anther-cells usually with small appendages at the lower end . . . . . 10. PITYRODIA.

Calyx-lobes much enlarged spreading and veined after flowering . . . . . 11. CYANOSTEGIA.

Corolla small, the tube narrow, the upper lip erect. Leaves mucronately toothed . . . . . 12. DENISONIA.

Corolla small, the tube broad. Fruit a succulent drupe (dry in the preceding genera) . . . . . 13. SPARTOTHAMNUS.

SUBTRIBE 2. **Euviticeæ**.—Ovary not at all or scarcely lobed. Fruit a drupe. Shrubs or trees. Seeds without albumen (or rarely in *Vitex* with a scanty albumen?).

Corolla small, usually 4 lobed, with a short tube. Stamens included or not much exserted.

Cymes axillary. Style dilated at the top or truncate . . . . . 14. CALLICARPA.

Cymes or panicles terminal. Style 2-lobed . . . . . 15. PREMNA.

Corolla 5-lobed, with a slender tube. Stamens long. Fruiting calyx enlarged and spreading (except in *C. hemiderma*) . . . . . 16. CLERODENDRON.

Corolla-tube broad, limb 4- or 5-lobed. Stamens not exceeding the upper lip. Drupe with a bony 4-celled putamen. Leaves simple . . . . . 17. GMELINA.

Corolla-tube short, limb 5-lobed. Stamens often exserted. Drupe with 2 or 4 distinct pyrenes. Leaves often digitately compound (sometimes simple) . . . . . 18. VITEX.

SUBTRIBE 3. **Oxereæ**.—Ovary distinctly 2- or 4-lobed.

Calyx 2-cleft. Tall climber with large flowers and fruits. Stamens exserted . . . . . 19. FARADAYA.

TRIBE 3. **Avicennieæ**.—Fruit a 2-valved capsule. Seed solitary, without integuments; embryo with large folded cotyledons.

Single genus . . . . . 20. AVICENNIA.

TRIBE 1. **VERBENÆ**.—Ovules ascending from the base of the cells. Flowers in racemes or spikes, sometimes contracted into heads, solitary within each bract, without bracteoles.

1. **LANTANA.** Linn.

Calyx small and thin, truncate or sinuately toothed. Corolla-tube slender; the limb spreading, 4- or 5-lobed, nearly regular or slightly 2-lipped. Stamens 4, included in the tube. Ovary 2-celled, with one ovule in each cell erect from the base. Fruit a more or less succulent drupe, the putamen 2-celled or dividing into two 1-celled pyrenes.—Shrubs or rarely herbs. Leaves opposite. Flowers in pedunculate axillary heads, rarely lengthening into spikes, each one sessile or nearly so within a small bract without bracteoles.

A considerable genus, chiefly from tropical or subtropical America, with two or three Asiatic or African species, which however may also have been of American origin. The ovary in this and the following genus, as shown by Bocquillon, although containing only 2 cells corresponding to the half-cells of other genera, is yet bicarpellary, one half only of each carpel being developed.

1. **L. Camara**, Linn.; *Schau. in DC. Prod.* xi. 598. A tall shrub with long weak branches, often armed with short recurved prickles, and more or less hairy. Leaves petiolate, ovate or slightly cordate, crenate, 2 to 3 in. long, wrinkled and very rough with short stiff hairs. Flowers yellow or orange, turning to a deep red; the heads not lengthening into spikes. Bracts linear-lanceolate, shorter than the corolla. Corolla-tube 3 to 4 lines long, lobes of the limb short and broad.

A common species in tropical America, frequently cultivated for ornament, and, escaping from gardens, now naturalised on the Hastings and Clarence rivers, *Beckler*, and probably in other parts of **N. S. Wales** and **Queensland**. As already observed in my "*Flora Hongkongensis*," the species should probably include as varieties several of those described by Schauer, in *DC. Prod.* xi. 597 and 598, as distinct.

2. **LIPPIA.** Linn.

(*Zapania*, Scop.)

Calyx membranous, either flattened with 2 keels or wings and 2-lobed, each lobe either entire or 2-toothed, or the whole calyx more equally tubular or globular and 2- or 4-toothed. Corolla-tube cylindrical or dilated upwards, the limb more or less distinctly 2-lipped, the upper lip entire or 2-lobed, the lower 3-lobed, all the lobes flat and spreading. Stamens 4, included in the tube or scarcely protruding. Ovary 2-celled, with 1 ovule in each cell erect from the base. Fruit not succulent, separating more or less readily into two indehiscent nuts.—Herbs or shrubs often glandular and aromatic or strong-scented. Leaves opposite or whorled, undivided. Flowers small, in simple spikes or heads, each one sessile in the axil of a single bract, without bracteoles, the bracts often closely imbricate.

A considerable American genus, a few species of which, including the two Australian ones, are also more or less widely spread over the warmer regions of the Old World. Bocquillon's character of the genus (*Revue*, p. 147), taken probably from the examination of a single species, will not apply to a large portion of the genus, including the commonest species of all, *L. nodiflora*.













6.11

Prostrate or creeping perennial. Leaves obovate or cuneate.

Peduncles in one axil of each pair. Calyx flat . . . . . 1. *L. nodiflora*.  
Shrub with straggling branches. Leaves ovate. Peduncles opposite. Calyx globular . . . . . 2. *L. geminata*.

1. ***L. nodiflora***, Rich.; Schau. in DC. Prod. xi. 585. A prostrate or creeping perennial, with shortly ascending flowering branches, hoary with closely appressed hairs or nearly glabrous. Leaves from obovate to linear-cuneate, coarsely toothed at the apex,  $\frac{1}{2}$  to 1 in. long, narrowed into a petiole. Peduncles axillary but only one to each pair of leaves and much longer than them, each one bearing a spike at first short and ovoid, and sometimes very small, at length cylindrical, and when luxuriant attaining  $\frac{1}{2}$  to  $\frac{3}{4}$  in. or even more. Bracts closely imbricate, broadly spatulate, more or less fringed or toothed at the end, nearly  $1\frac{1}{2}$  lines long. Calyx shorter than the bract, membranous, flat, divided in front nearly to the base, at the back to about the middle, into two keeled lobes, entire or 2-toothed at the apex. Corolla-tube scarcely exceeding the calyx, the lower lip twice as long as the upper one and about half as long as the tube. Fruit not one line long, readily separating into two nuts, with one half of the calyx adhering to each.—*Zapania nodiflora*, Lam.; R. Br. Prod. 514.

**N. Australia.** Victoria river, F. Mueller.

**Queensland.** Shoalwater Bay and Broad Sound, R. Brown; Port Denison, Fitzalan; Fitzroy river, Thozet; Bowen river, Bowman; Moreton island, M'Gillivray.

**W. Australia.** Murchison river, Oldfield.

The species is very common in waste lands on banks and in sandy places, &c., all over the warmer parts of the world. It is very variable in the breadth of the leaves, the size of the spikes and flowers, the points and teeth of the bracts, &c.

2. ***L. geminata***, Kunth; Schau. in DC. Prod. xi. 582. A strongly scented shrub, with long straggling branches, more or less hirsute, the young shoots often hoary. Leaves opposite or rarely in whorls of three, from broadly ovate to ovate-oblong, obtuse, crenate, very rugose,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long when broad, longer when narrow. Peduncles much shorter than the leaves, and mostly in both axils, each one bearing a small head of pink flowers becoming ovoid as the flowering advances. Bracts very broad, herbaceous, hispid, 1 to  $1\frac{1}{2}$  lines long. Calyx shorter than the bract, membranous, nearly globular, neither flattened nor ribbed, 2-lobed, the lobes broad and obscurely 2-toothed. Corolla-tube  $1\frac{1}{2}$  lines long, dilated upwards, the lobes short broad and nearly equal. Fruit separating into two nuts.

**Queensland.** About Rockhampton, Dallachy and others. Probably introduced from South America, where it is often common, ranging from Buenos Ayres to Mexico.

### 3. VERBENA. Linn.

Calyx 5-toothed. Corolla with a distinct tube, the limb spreading, rather unequally 5-lobed. Stamens 4 or rarely 2, included in the tube. Ovary 4-celled, with one ovule in each cell erect from the base. Fruit not succulent, enclosed in the calyx, separating more or less readily into 4 1-seeded nuts.—Herbs or rarely shrubs. Leaves

opposite, entire or divided. Flowers small, alternate, in simple or branched spikes, each one in the axil of a small bract without bracteoles.

The genus comprises a large number of American species, with only two natives of the warmer regions of the Old World, including one of the Australian ones; the other species here enumerated is an introduced one from America.

Leaves mostly deeply lobed or divided. Spikes long and slender,  
with distant flowers . . . . . 1. *V. officinalis*.  
Leaves narrow, toothed. Spikes rather close, in a terminal  
cluster or panicle . . . . . 2. *V. bonariensis*.

1. ***V. officinalis***, *Linn.*; *Schau. in DC. Prod.* xi. 547. An erect perennial, 1 to 2 ft. high, with long spreading wiry branches, sometimes nearly glabrous, usually with closely appressed hairs, sometimes more coarsely hirsute, or the inflorescence rough with glandular hairs. Lower leaves petiolate, obovate or oblong, coarsely toothed or cut; upper ones either deeply pinnatifid and lobed or toothed, or the uppermost small and lanceolate. Flowers usually very small, in slender spikes lengthening often to 8 or 10 in., the lower ones becoming distant as the spike lengthens, the whole corolla sometimes not 2 lines long, but in the larger-flowered forms the tube about  $1\frac{1}{2}$  lines, and the lower lip about as long.—*R. Br. Prod.* 514.

**Queensland.** Broad Sound and Shoalwater Bay, *R. Brown*; Rockingham Bay, *Dallachy*; Suttor river, *Bowman*; Armadilla, *Barton*.

**N. S. Wales.** Port Jackson, *R. Brown*; Blue mountains, *Miss Atkinson*; Clarence river, *Beckler*; Richmond river, *Fawcett*; Darling river, *Victorian and other Expeditions*.

**Victoria.** Port Phillip, *F. Mueller*; Melbourne, *Robertson*; Portland, *Allitt*; Skipton, *Whan*.

**S. Australia.** Near Adelaide, *Blandowski*; towards Spencer's Gulf, *Warburton*.

The species is common in a great part of Europe and temperate Asia, in waste places on roadsides, &c.; more rare and perhaps introduced into North America, South Africa, and within the tropics. It may also be introduced only into some of the Australian stations.

**Var. *macrostachya*.** Flowers rather larger, and the spikes very glandular, hirsute.—*V. macrostachya*, *F. Muell. Fragm.* i. 60.—Peak Downs, *F. Mueller*; Rockhampton, *Bowman*.

\*2. ***V. bonariensis***, *Linn.*; *Schau. in DC. Prod.* xi. 541. An erect coarse rigid herb of 2 to 4 ft., the stems scarcely branched, acutely 4-angled and roughly hispid especially on the angles. Leaves sessile, lanceolate or the lower ones ovate-lanceolate,  $1\frac{1}{2}$  to nearly 3 in. long, coarsely toothed, hirsute, the upper ones distant small and narrow. Flowers in rather close spikes of  $\frac{1}{2}$  to  $\frac{3}{4}$  in., which are usually clustered at the end of the branches of a rigid corymbose trichotomous panicle, and generally assume a blueish purple hue. Bracts acute, ciliate, hirsute, 1 to  $1\frac{1}{2}$  lines long. Calyx shorter than the bract. Corolla-tube shortly exceeding the calyx, the lobes broad and spreading.

**Queensland.** Brisbane river, Moreton Bay, *F. Mueller*.

**N. S. Wales.** Near Sydney, *F. Mueller*; New England, *C. Stuart*; Hastings river, *Beckler*.







The species is common in waste places and pastures in extratropical South America, and has spread as a weed of cultivation over South Africa, the Mauritius, and some other countries, and is evidently introduced only into Australia.

**TRIBE 2. VITICEÆ.**—Ovules amphitropous, laterally attached above the base or sometimes so near the top as to appear pendulous, but the micropyle always inferior, the funicle either very short or more or less lengthened and then arising from the base of the placenta. Flowers in axillary or terminal cymes or heads, or, if solitary, on axillary or spicate pedicels, usually accompanied by two bracteoles besides the subtending bract.

In many of the genera of this tribe the ovary is not perfectly divided into cells, the incurved ovuliferous margins of the carpellary leaves not meeting in the centre at the time of flowering, and the ovary has in these cases been described by Bocquillon as one-celled with parietal placentas. The ovules are, however, never placed on the inner face of the expanded placentas as in Gesneriaceæ and other Orders with a normally parietal placentation, and usually, after flowering, the placentas meet in the centre and unite, or the endocarp grows and hardens so as completely to enclose each seed, forming a fruit perfectly divided into cells, or only leaving a small central cavity, described by earlier authors as a third or a fifth empty cell.

**SUBTRIBE 1. CHLOANTHÆ.**—Ovary not lobed. Fruit small, dry, the mesocarp not succulent, the endocarp thin or hard, 4-celled or more frequently separating into two 2-celled or four 1-celled nuts, sometimes reduced by abortion to a single 1-seeded nut. Shrubs undershrubs or rarely herbs, usually very cottony or woolly, with branched hairs, rarely more glabrous and glutinous or resinous. Flowers often solitary within each bract or floral leaf, but sometimes in cymes as in Euviticeæ.

The ripe seeds have been observed in a few species only, and these have shown a rather copious albumen. This character may not, however, be constant in the subtribe. The ten following genera—perhaps all that strictly belong to the subtribe—are all endemic in Australia.

#### 4. LACHNOSTACHYS, Hook.

(*Walcottia*, *F. Muell.* *Pycnolachne*, *Turcz.*)

Calyx broadly campanulate, 5- to 8-lobed, valvate in the bud, densely woolly outside, glabrous inside. Corolla shorter than the calyx, broadly campanulate, truncate or very shortly and equally 5- to 8-lobed. Stamens 5 to 8, exserted, opposite to the calyx-lobes, inserted on the margin of the corolla or between its lobes; anthers without appendages. Ovary 2-celled, with 2 ovules in each cell laterally attached below the top. Style slender, entire or minutely 2-lobed. Fruit enclosed in the calyx, hard, usually 1-celled and 1-seeded by abortion.—Erect shrubs clothed with a dense cotton or wool consisting of intricate branched hairs. Leaves opposite, sessile, undivided. Flowers opposite and sessile in dense terminal woolly spikes. Bracts often imbricate in 4 rows in the young spikes, but very deciduous; bracteoles minute or none.

The genus is endemic in W. Australia. In the two species first published the dissepiment of the ovary is very thin, and readily breaks off from the walls of the cavity, and

as only one ovule enlarges, the whole on a hasty examination has the appearance of a 1-celled uniovulate ovary; this with the short membranous corolla with marginal stamens, suggested the idea of a staminal cup, and induced the referring the plant to Amarantaceæ, a view which Moquin adopted without re-examining the ovary. A more careful scrutiny shows however an ovary characteristic of a considerable group of Verbenaceæ, and scarcely to be found in any other Order; and this affinity is fully confirmed by the since described *Lachnostachys Walcottii*, which has the corolla-lobes shortly developed between the stamens. The habit and peculiar rudimentum are entirely those of *Newcastlia*, which has also regular flowers with isomerous stamens, and of which one species, *N. spodiotricha*, only differs from *Lachnostachys* in the greater development of the corolla-lobes, and in the parts of the flowers being in fives only, whilst in one species of *Lachnostachys* they are in sixes or rarely in fives, and in the three others in eights or rarely in sevens. F. Mueller has, however, placed *Lachnostachys* in Buetineriaceæ, from which it appears to me to differ essentially in the position of the stamens, opposite to not alternating with the calyx-lobes, and in the structure of the ovary, independently of the habit, the pistil, and the supposition that the cup supporting the stamens is a corolla and not the united base of the filaments only.

Spikes simple. Flowers 6-merous, rarely 5-merous . . . . . 1. *L. albicans*.

Spikes paniculate. Flowers 8-merous, rarely 7-merous.

Leaves ovate or oblong with revolute margins, 1 to 3 in. long.

Wool very long and dense . . . . .

Leaves ovate or oblong, nearly flat,  $\frac{3}{4}$  to 1 in. long. Tomentum thick but close and short . . . . .

Leaves oblong-linear, with revolute margins. Panicle much branched. Tomentum close and short. Corolla distinctly lobed . . . . .

2. *L. verbascifolia*.

3. *L. ferruginea*.

4. *L. Walcottii*.

1. ***L. albicans***, *Hook. Ic. Pl. t.* 414.—A shrub of several ft., with rather thick erect branches, hoary or white as well as the foliage with a close but dense cottony wool. Leaves oblong-lanceolate, obtuse or almost acute, erect, decussate, thick, the margins often narrowly recurved and slightly rugose-crenulate,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long. Spikes terminal, simple, the flowers concealed in a dense silky-woolly mass, 1 to 2 in. long, and  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter. Calyx about  $1\frac{1}{2}$  lines long and opening to 2 lines diameter, divided to about  $\frac{1}{2}$  into 5 or more, frequently 6, broad triangular lobes, the external wool at least twice as long as the whole calyx. Corolla rather shorter than the calyx, glabrous outside, hirsute inside with long hairs, truncate, the filaments quite marginal, without lobes between them, and only to be traced down the tube by a darker vein. Ovary densely villous. Young fruit shorter than the calyx, thick and hard, with only one ovule enlarged, but not seen ripe.—Moq. in DC. Prod. xiii. ii. 298; Nees in Pl. Preiss. i. 631.

**W. Australia**, *Drummond*, n. 13, 434; Wellington district, *Preiss*, n. 1377.

2. ***L. verbascifolia***, *F. Muell. Fragm.* vi. 158. A tall stout shrub, very densely clothed in every part with long silky-woolly hairs, more or less ferruginous. Leaves crowded, decussate, ovate or oblong, obtuse, very thick and soft, with revolute margins, 1 to 3 in. long. Spikes apparently few, in a short dense terminal panicle, but the inflorescence imperfect in our specimens. Calyx  $1\frac{1}{2}$  to nearly 2 lines long, divided like that of *L. ferruginea* into 8 finely pointed lobes, but the external wool longer and more silky. Corolla short, the filaments quite marginal, without intervening lobes. Ovary certainly 2-celled,





with 2 ovules in each cell, but as in *L. ferruginea* and *L. albicans*, only 1 ovule enlarges.

**W. Australia**, *Drummond*, 5th coll. n. 237.

I have not succeeded in finding ripe seeds in our specimens, but F. Mueller has observed them to be albuminous with a straight embryo as in the allied genera.

**3. *L. ferruginea***, *Hook. Ic. Pl. t.* 415. A tall shrub, covered with a soft dense cottony-wool, thicker than in *L. Walcottii*, almost floccose, and of a more rusty colour. Leaves oblong ovate or almost orbicular, obtuse, soft and very thick, the margins thickened underneath but scarcely recurved,  $\frac{3}{4}$  to 1 in. long. Spikes rather dense, 1 to 2 in. long, and  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter, several in a terminal spreading panicle. Bracts (or floral leaves) orbicular, thick and brown, imbricate in 4 rows in the young spike, but soon falling off, leaving each flower a globular woolly mass of 2 to 3 lines diameter. Calyx nearly 2 lines long, divided to below the middle into 8 or sometimes 7 narrow finely pointed lobes. Corolla rather shorter than the calyx, glabrous outside, bearded with long hairs inside, but not so densely so as in *L. albicans*. Stamens quite marginal, without lobes between them. Young fruit as in *L. albicans*, but not seen ripe.—*Moq. in DC. Prod.* xiii. ii. 298.

**W. Australia**, *Drummond*, n. 14, 202, 438.

**4. *L. Walcottii***, *F. Muell. Fragm.* ii. 140. A tall shrub, covered with a close but soft cottony-wool sometimes almost floccose. Leaves oblong-linear, obtuse, thick, with closely revolute margins,  $\frac{3}{4}$  to 1½ in. long. Spikes not very dense but many-flowered, 1 to 2 in. long, numerous in dense corymbose or pyramidal panicles of several inches diameter, each flower a woolly ball of about 2 lines diameter, showing in the centre a small glabrous corolla only when fully expanded. Calyx about 1½ lines diameter when spread open, divided to the middle into 8 acute lobes. Corolla rather shorter than the calyx, with 8 very short rounded reticulate lobes. Stamens inserted in the notches and prominently decurrent in the tube to the base of the corolla, where there are a few hairs inside. Ovary glabrous or minutely pubescent. Fruit already somewhat enlarged, apparently ripening 2 or 3 seeds and divided into as many cells by spurious dissepiments, but not seen ripe.—*Walcottia eriobotrya*, *F. Muell. Fragm.* i. 241; *Pycnolachne ledifolia*, *Turcz. in Bull. Soc. Imp. Nat. Mosc.* 1863, ii. 215.

**W. Australia**. Murchison river, *Walcott and Oldfield*, *Drummond*, 6th coll. n. 219, 220.

## 5. **NEWCASTLIA**, *F. Muell.*

Calyx campanulate, 5-lobed, valvate in the bud. Corolla-tube campanulate, the limb of 5 nearly equal lobes. Stamens 5; anthers without appendages. Ovary small, completely 2-celled with 2 ovules in each cell laterally attached above the middle. Style slender, entire, or minutely 2-lobed. Fruit not exceeding the calyx, not succulent, apparently separating into 4 nuts.—Densely woolly or cottony shrubs.

Leaves opposite, undivided. Flowers opposite and sessile, in dense terminal woolly spikes. Bracts and bracteoles small and deciduous.

The genus is endemic in Australia, and closely allied to *Physopsis* and *Mallophora*, differing from them chiefly in the 5-merous flowers.

Wool loose. Corolla-lobes short. Stamens shorter than the corolla . . . . .	1. <i>N. cladotricha</i> .
Tomentum close. Corolla-lobes ending in a fine point. Stamens exserted . . . . .	2. <i>N. spodiotricha</i> .

1. ***N. cladotricha***, *F. Muell. in Hook. Kew Journ.* ix. 22, *Fragm.* i. 184, *t. i. and iii.* 21. An erect shrub, attaining 2 to 3 ft., densely clothed with white or rust-coloured woolly branching hairs, and strongly scented. Leaves sessile, narrow-oblong to ovate-lanceolate, obtuse, rounded at the base, the margins slightly recurved,  $\frac{3}{4}$  to above 1 in. long, thick, very rugose, reticulate underneath, loosely hirsute or tomentose on both sides with branched hairs. Flowering spikes at first short and dense but lengthening sometimes to 2 in. and interrupted. Bracts ovate or ovate-lanceolate, imbricate in the very young spike, but falling off early. Calyx about  $1\frac{1}{2}$  lines long, very woolly, the lobes rather shorter than the tube. Corolla glabrous outside, the tube broad, about as long as the calyx, lobes short and spreading. Stamens about as long as the tube, inserted above a woolly ring near the base. Ovary glabrous. Ovules attached near the top, but the seed enlarges upwards so as to be attached near the base. The fruit not seen however quite ripe.

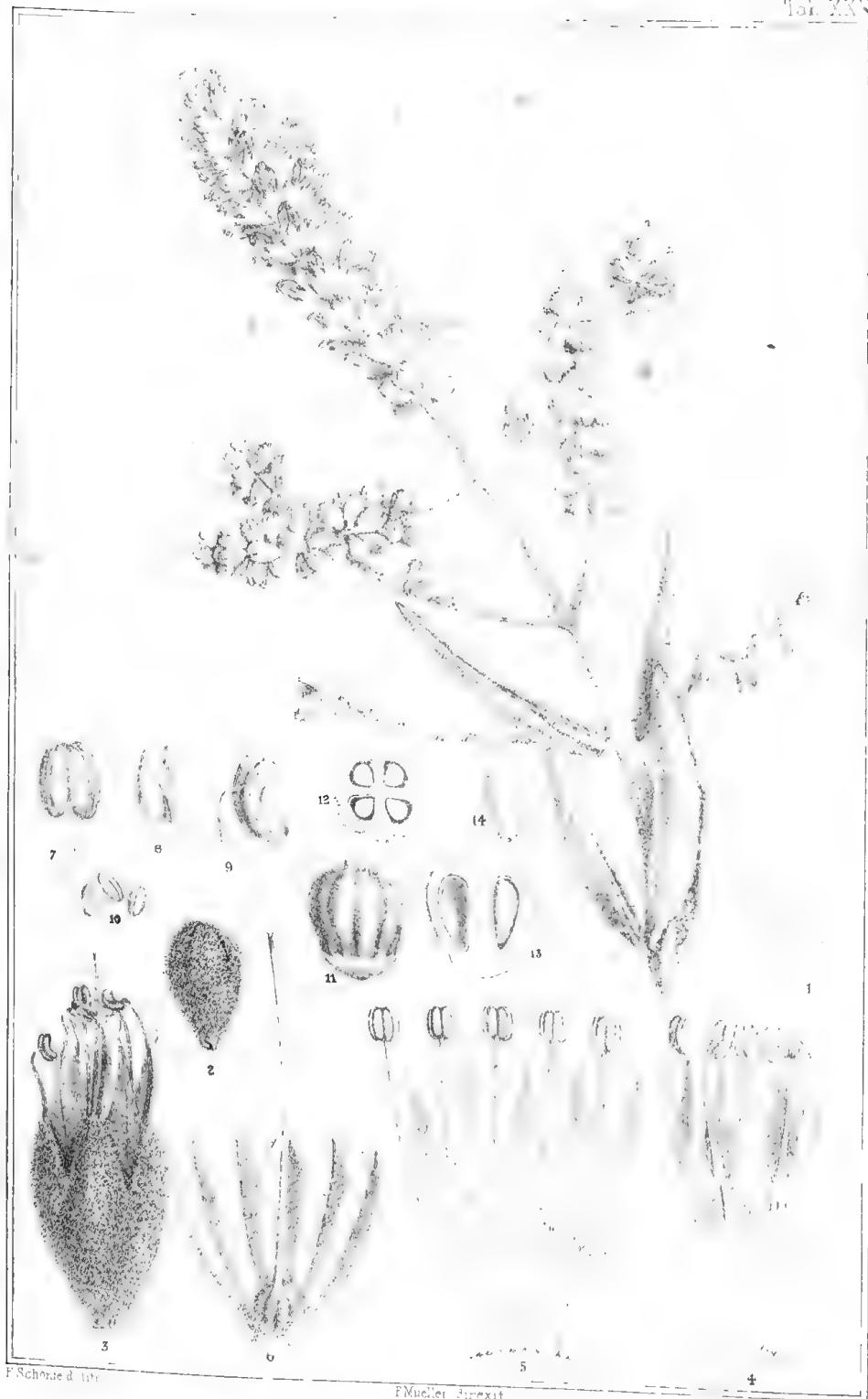
**N. Australia.** Sturt's Creek, near Mount Mueller, *F. Mueller*.

2. ***N. spodiotricha***, *F. Muell. Fragm.* iii. 21, *t.* 21. A shrub or undershrub, clothed with a rather shorter and closer tomentum than that of *N. cladotricha*. Leaves very shortly petiolate, ovate-oblong, obtuse, 1 to 2 in. long, rugose above, reticulate underneath, tomentose on both sides. Flowers in terminal cottony spikes, with 1 or 2 pairs of lateral ones at the base, forming a pyramidal panicle. Bracts not seen. Calyx nearly sessile, about 2 lines long, the lobes much shorter than the tube. Corolla-tube as long as the calyx, very hairy inside near the top, the lobes narrow, ending in a point nearly as long as the tube, and longer than the lobes themselves. Stamens inserted at the top of the corolla-tube between the lobes, and longer than them, the upper anthers sometimes abortive. Ovary glabrous, the ovules attached at or near the top.

**N. Australia.** Between lat. 17° 30' and 18° 30', *M'Douall Stuart*.

## 6. **PHYSOPSIS**, Turczan.

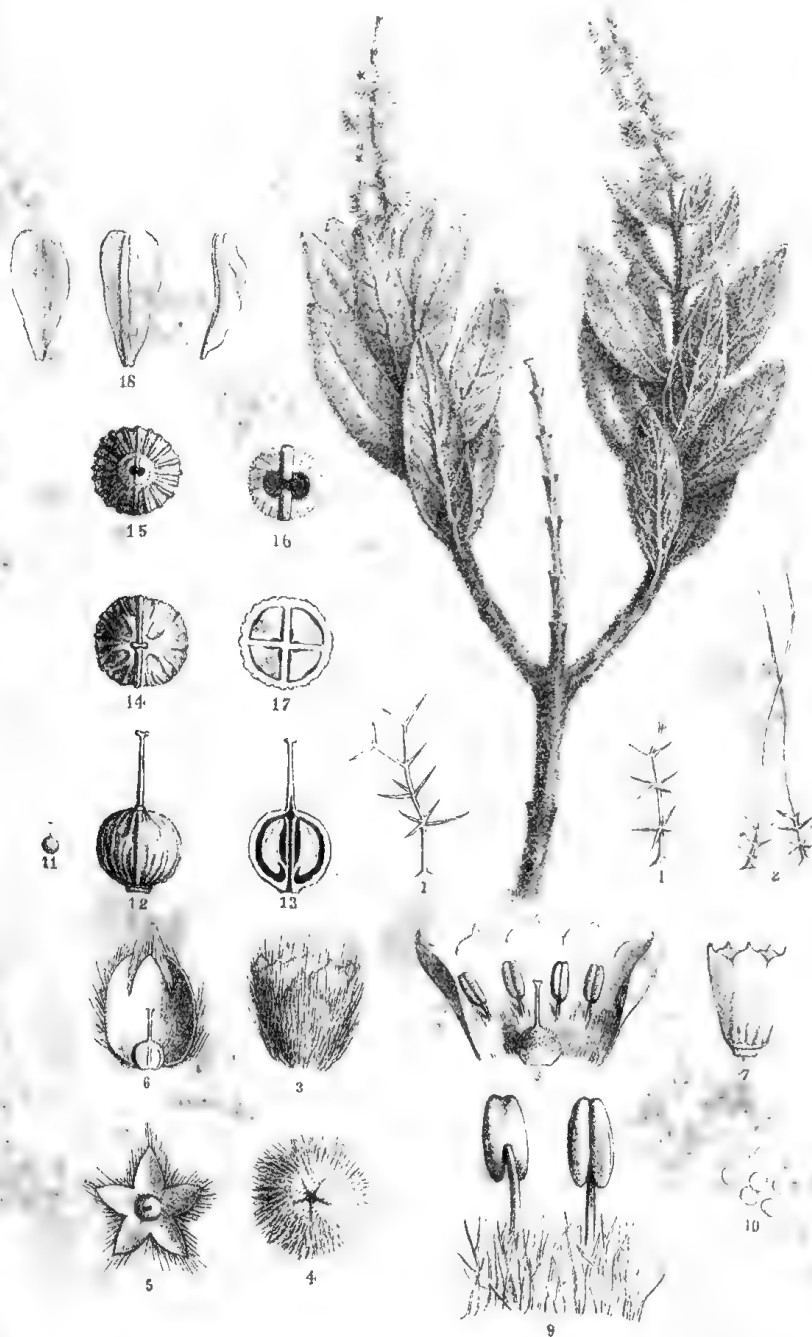
Calyx tubular, 4-toothed. Corolla-tube short, cylindrical, the limb of 4 nearly equal spreading lobes. Stamens 4, included in the tube; anthers without appendages. Ovary 2-celled, with 2 ovules in each cell, laterally attached above the middle, but usually only 1 ovule perfect. Style slender, very shortly 2-lobed. Fruit dry, enclosed in the calyx,



*Newcastleia spodistrifera*. F. M.



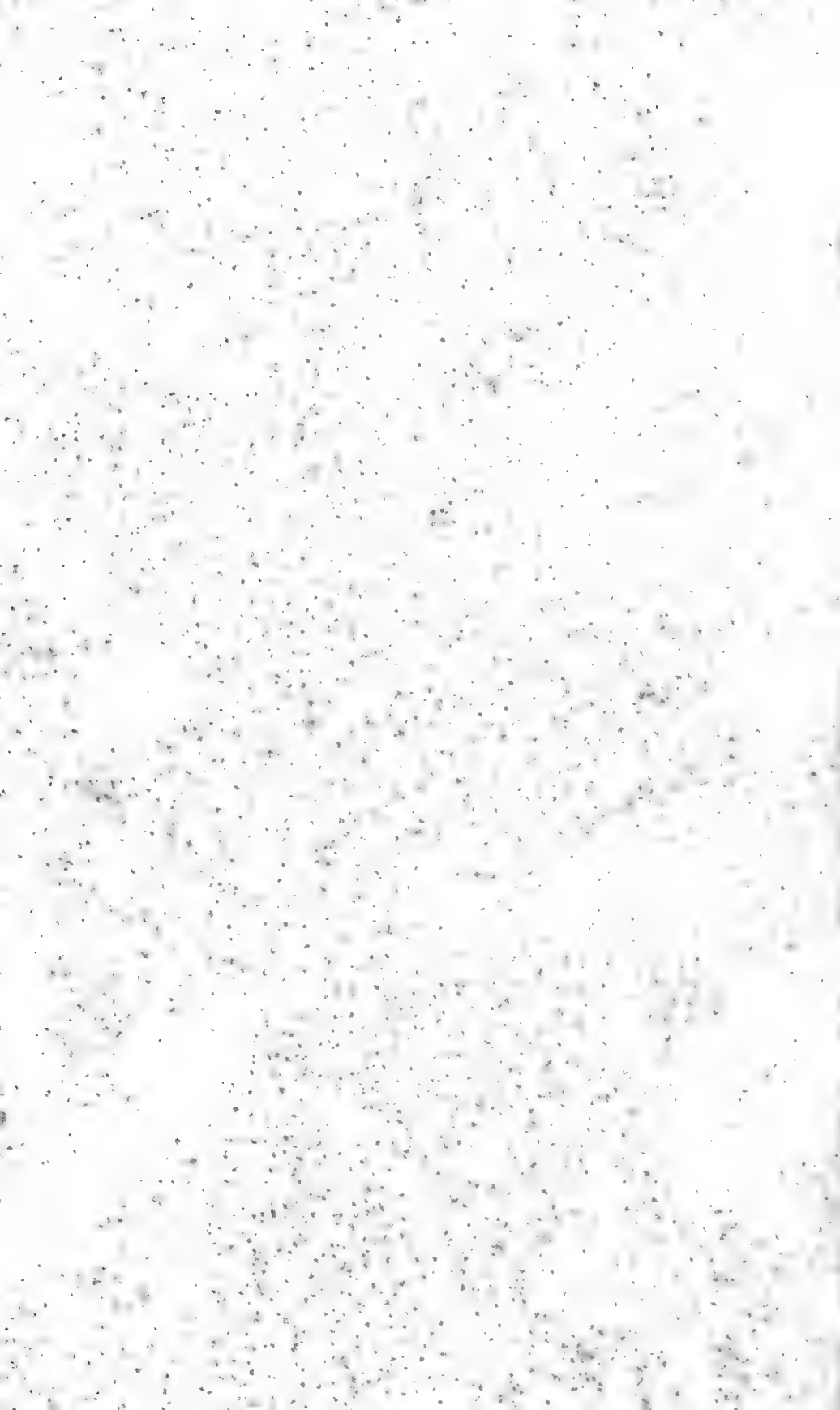




Ludwig Becker del. &amp; lith.

Ludwig Becker del.

*Newcastleia cladotricha* R.V.











often reduced to a single cell and seed.—Woolly shrub. Leaves scattered, undivided. Flowers small, opposite and sessile, in a dense woolly spike, each one within a small bract.

The genus consists of a single species endemic in Australia, differing from *Mallophora* chiefly in inflorescence.

1. **P. spicata**, Turcz. in *Bull. Soc. Imp. Nat. Mosc.* 1849, ii. 35. An erect shrub, with rather stout woolly-tomentose virgate branches. Leaves scattered or irregularly opposite, sessile, oblong, obtuse, with recurved margins, narrowed at the base, rarely exceeding  $\frac{1}{2}$  in., glabrous or slightly scabrous and nerveless on the upper side, cottony-white underneath. Spikes dense, either solitary or clustered at the ends of the branches, usually 1 to  $1\frac{1}{2}$  in. long, each flower sessile within a linear bract, which is glabrous inside, woolly outside, and very deciduous. Calyx enveloped in cottony-wool forming an ovoid mass about 3 lines long, the calyx itself, when stripped of its wool nearly tubular and very shortly 4-toothed. Corolla-tube scarcely exceeding the calyx, slightly thickened inside at the throat, the lobes broad and obtuse. Stamens inserted above the middle of the tube, the filaments very short. Ovary glabrous, inserted on a disk, in the very young bud completely 2-celled with 2 ovules in each cell, but at the time of flowering usually very oblique with only one perfect ovule.

**W. Australia**, Drummond, 4th coll. n. 234.

## 7. MALLOPHORA, Endl.

(*Lachnocephalus*, Turcz.)

Calyx deeply divided into 4 lobes. Corolla-tube short, cylindrical, the limb of 4 equal spreading lobes. Stamens 4, shortly exerted; anthers without appendages. Ovary 2-celled, with 2 ovules in each cell laterally attached above the middle. Style filiform with 2 linear lobes. Fruit dry, 4-celled, with 1 seed in each cell.—Cottony or woolly undershrub. Leaves opposite or scattered, undivided. Flowers small, sessile, in dense cottony-woolly heads which are either solitary or corymbose at the ends of the branches.

The genus is limited to a single species endemic in Australia, closely allied to the two preceding genera, but with a more divided style and the inflorescence nearer to that of *Dicrastyles*.

1. **M. globiflora**, Endl. *Nov. Stirp. Dec.* 64. Stems from a woody base rather slender, apparently ascending or erect, branching, 1 to  $1\frac{1}{2}$  ft. high, covered as well as the foliage with a close white intricate tomentum. Leaves sessile or nearly so, linear or oblong, obtuse,  $\frac{1}{4}$  to nearly  $\frac{1}{2}$  in. long, narrowed at the base, rather thick, flat, cottony-white on both sides or becoming at length nearly glabrous above and then rugose. Flower-heads dense, either solitary or more frequently several in terminal corymbs, each flower sessile within a woolly bract, the outer bracts of each head rather larger than the others, but none of them exceeding the calyx. Calyx enveloped in a long dense wool

forming globular masses of 2 to 3 lines diameter, within the wool the calyx is deeply divided into linear membranous lobes. Corolla-tube scarcely so long as the calyx, the lobes small, obtuse, woolly outside. Stamens inserted within the tube. Ovary cottony, the 4 ovules usually perfect. Style-lobes linear, but much shorter than in *Dicrastyles*. Fruit, according to Endlicher, tomentose and 4-celled.—*Lachnocephalus lepidotus*, Turcz. in Bull. Soc. Imp. Nat. Mosc. 1849, ii. 36.

**W. Australia**, *Drummond*, n. 72, 555, and 4th coll. n. 235.

Bocquillon (Rev. Verb. p. 138) places *Lachnocephalus* (*Mallophora*) in his section with irregular flowers, but the corolla appears to me to be as nearly regular as in *Dicrastyles* and other so-called regular-flowered Verbenaceæ.

### 8. DICRASTYLES, Drum.

Calyx more or less deeply divided into 5 lobes. Corolla-tube short, the limb of 5 nearly equal short lobes. Stamens 5, exserted; anthers without appendages. Ovary 2-celled, with 2 ovules in each cell, laterally attached at or above the middle. Style deeply divided into 2 slender branches or lobes. Fruit small, dry, 4-celled, with 1 seed in each cell.—Cottony or woolly undershrubs or small shrubs. Leaves opposite or scattered, undivided. Flowers small, in cymes collected into corymbose panicles, more rarely contracted into dense solitary or corymbose heads. Bracts and bracteoles very deciduous.

The genus is limited to Australia. It is nearly related to *Mallophora*, but the inflorescence is usually looser, the flowers pentamerous, and the style much more deeply divided.

Leaves petiolate, lanceolate, very rugose but flat,  $1\frac{1}{2}$  to 3 in.

Cymes in a pyramidal panicle

Leaves nearly sessile, oblong, rugose but flat,  $\frac{1}{2}$  to 1 in. Cymes in loose corymbose panicles

Leaves sessile, oblong, rugose, with revolute margins, under 1 in. Cymes very dense, in corymbose panicles

Leaves linear, with revolute margins,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. Flowers small, in corymbose panicles

Leaves sessile, very rugose, with revolute margins. Flowers in dense heads. Diffuse, *Filago*-like plant

1. *D. ochrotricha*.

2. *D. fulva*.

3. *D. reticulata*.

4. *D. parvifolia*.

5. *D. stæchas*.

1. ***D. ochrotricha***, *F. Muell. Fragm.* iv. 161. An erect shrub of 1 to 2 ft., densely clothed with a rather close woolly tomentum, often assuming a golden yellow colour. Leaves opposite, lanceolate, obtuse, contracted into a rather long petiole, thick soft and woolly on both sides when young, scabrous and rugose above when old, reticulate and tomentose underneath,  $1\frac{1}{2}$  to nearly 3 in. long, the upper floral ones reduced to small bracts. Cymes opposite, pedunculate, forming a short pyramidal terminal panicle, the pedicels and calyxes very woolly-hirsute with short golden-yellow branching hairs. Pedicels  $\frac{1}{2}$  to  $3\frac{1}{2}$  lines long, thicker than in the other species. Calyx about 2 lines long, divided to rather below the middle into rather broad obtuse lobes. Corolla scarcely exceeding the calyx, the tube woolly outside, the lobes small. Stamens less exserted than in the other species. Ovary very woolly as well as the entire part of the style; ovules attached very near the top.







Style-branches glabrous, about as long as the entire part. Fruit small, depressed globular, not seen quite ripe.—*Pityrodia exsuccosa*, F. Muell. Fragm. i. 60.

**N. Australia.** Sturt's Creek, near Mount Wilford, F. Mueller.

2. **D. fulva**, *Drumm. in Hook. Kew Journ.* vii. 56. A perennial or undershrub with erect simple or branched stems of 1 to 2 feet, densely clothed with a whitish, or more frequently brownish cottony wool, sometimes almost floccose in the lower part, looser and longer towards the inflorescence. Leaves mostly opposite, narrow-ovate or oblong, obtuse, narrowed at the base,  $\frac{1}{2}$  to above 1 in. long, very thick soft and reticulate-rugose, but the wrinkles concealed by the wool till it wears off with age. Flowers very numerous, in broad trichotomous corymbose panicles, the clusters when young forming globular woolly heads surrounded by woolly bracts, but much looser when fully out, when the bracts fall away and each flower is on a little filiform pedicel of  $\frac{1}{2}$  to 1 line. Calyx about 1 line long, hirsute with branched hairs, not so woolly as in *Mallophora*, divided to the middle or more deeply into rather unequal lobes. Corolla almost campanulate, about  $1\frac{1}{2}$  lines long, the lobes as long as the tube and equal. Stamens inserted a little below the lobes and as long as or rather longer than them. Ovary tomentose. Style hairy with glabrous branches about as long as the entire part.—*Pityrodia myriantha*, F. Muell. Fragm. i. 236.

**W. Australia.** Northern districts, *Drummond*; Murchison river, *Oldfield*; Dirk Hartog's island, *Martin*.

3. **D. reticulata**, *Drumm. in Hook. Kew Journ.* vii. 57. An undershrub or shrub with the general habit of *D. fulva*, the stems erect or ascending covered with the same dense cottony wool of a white or brownish hue. Leaves opposite or scattered, sessile, oblong or ovate-lanceolate, obtuse, usually smaller than in *D. fulva*, less narrowed at the base, the margins revolute, much wrinkled above and reticulate underneath, pubescent above and hoary-tomentose underneath, but the cotton not dense enough to conceal the reticulations. Flowers rather larger than in *D. fulva*, in dense heads of  $\frac{1}{2}$  to 1 in. diameter, which are either several together in terminal corymbs or solitary on the side branches, the outer bracts often leaflike, the inner ones small. Pedicels about 1 line long. Calyx rather more than 1 line long, divided to the base into linear segments. Corolla 2 to  $2\frac{1}{2}$  lines long, the lobes shorter than the tube. Stamens longer than the corolla-lobes. Ovary tomentose. Style rather longer than in *D. fulva*, hairy with glabrous branches.

**W. Australia**, *Drummond*, 4th coll. n. 94.

*Mallophora corymbosa*, Endl. Nov. Stirp. Dec. 64, appears to me from a cursory inspection without examination of the specimen in the Vienna herbarium, to be a very woolly variety of *Dicrastyles reticulata*.

4. **D. parvifolia**, F. Muell. *Fragm.* ii. 160. An erect undershrub or shrub of 1 to 2 ft., with numerous rather slender branches, the whole plant hoary or white with a close tomentum. Leaves linear, obtuse,

with revolute margins, from  $\frac{1}{4}$  to rather above  $\frac{1}{2}$  in. long, losing the tomentum on the upper side when old, and then somewhat rugose. Flowers in compact head-like cymes, forming trichotomous corymbose panicles as in *D. fulva*, but very much smaller and the bracts very small. Calyx almost sessile, scarcely above  $\frac{1}{2}$  line long, divided almost to the base into oblong segments. Corolla about 1 line long, very broad and open, the lobes much longer than the tube and one larger than the others. Stamens 5 as in the other species, longer than the corolla. Ovary tomentose. Style-branches longer than the entire part.—*D. rosmarinifolia*, Turcz. in Bull. Soc. Imp. Nat. Mosc. 1863; ii. 226.

**W. Australia**, Drummond, n. 176, 236; Young river, East river, and Oldfield river, Maxwell.

5. **D. stœchas**, Drumm. in Hook. Kew Journ. vii. 57. A diffuse, much branched, low undershrub, with the aspect of a *Gnaphalium* or *Filago*, densely clothed in every part with white wool. Leaves opposite or scattered, sessile, oblong, obtuse, with revolute margins, 2 to 4 lines long, thick and soft, very rugose under the white wool. Flowers numerous in dense terminal woolly heads of  $\frac{1}{2}$  to  $\frac{3}{4}$  in. diameter, not paniculate. Bracts small except the outer ones which are sometimes leafy and 1 to 2 lines long. Calyx about 1 line long, divided to the base into linear lobes. Corolla  $1\frac{1}{2}$  lines long, the lobes rather shorter than the tube. Stamens longer than the corolla-lobes. Ovary as well as the entire part of the style tomentose or woolly, containing but a single cell and ovule in all the flowers examined, but they were all somewhat enlarged after fecundation, probably as in the rest of the genus 2-celled at an earlier stage, but in the rather numerous specimens in the collections before me I have not succeeded in finding either buds or far advanced fruits.

**W. Australia**, Drummond, 5th coll. suppl. n. 95.

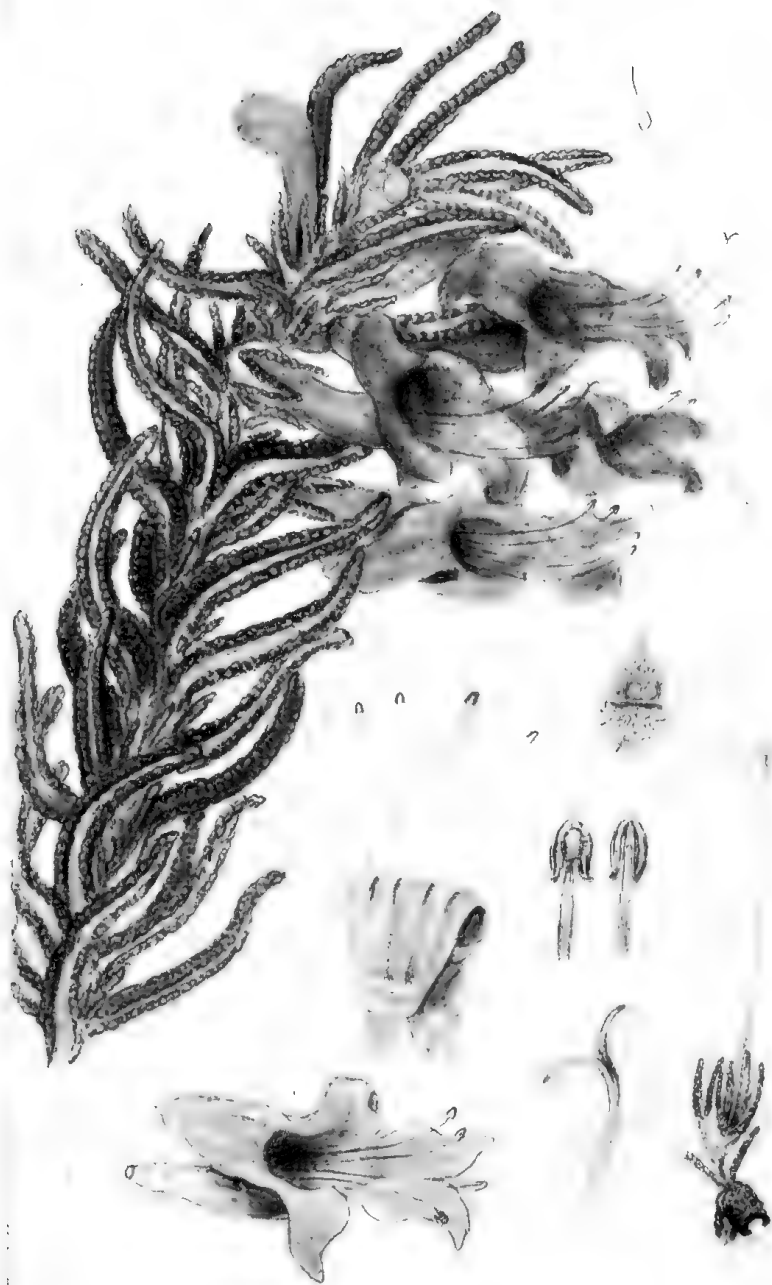
## 9. CHLOANTHES, R. Br.

Calyx more or less deeply divided into 5 narrow herbaceous lobes. Corolla-tube elongated, usually incurved and dilated upwards; limb 2-lipped, the upper lip erect at the base with two spreading lobes, the lower lip three-lobed, spreading. Stamens 4, somewhat didynamous, inserted below the middle of the tube above a ring of cottony hairs, shorter than the upper lip; anthers without any or with very obscure appendages. Ovary imperfectly or almost perfectly 2-celled with 2 ovules in each cell laterally attached. Style very shortly 2-lobed. Fruit a dry 4-celled drupe, the endocarp separating into 2 hard 2-celled nuts, leaving between them a central cavity reaching halfway up. Seeds solitary in each cell, ascending, with a thin testa and copious albumen.—Perennials undershrubs or shrubs, more or less cottony woolly or glandular-hirsute. Leaves opposite or in whorls of three, narrow, bullate-rugose and decurrent along the stem. Flowers axillary,









*... (S. ...)*



solitary, shortly pedicellate, with a pair of bracteoles below the calyx, the upper flowers sometimes forming a leafy spike.

The genus is limited to Australia. The transformation of the imperfectly 2-celled ovary into a completely 4-celled fruit in this and the following genera is effected by the growth of the endocarp round the seeds, filling up the cavity in the upper part, but usually leaving in the lower part a vacuity or so-called fifth empty cell.

Flowers mostly axillary and distant. Eastern species.

Leaves lanceolate, the margins scarcely revolute, shortly hispid on both sides, not cottony underneath. Flowers large, the tube narrow

Leaves narrow with very recurved margins, white underneath.

Corolla tube narrow (variable in size), glabrous inside except the ring of hairs near the base

Corolla-tube short and broad, hairy inside under the upper lip

Flowers in short leafy spikes at the ends of the branches. Western species

1. *C. glandulosa*.

2. *C. stœchadis*.

3. *C. parviflora*.

4. *C. coccinea*.

*Pityrodia uncinata* and *P. Barlingii* are usually placed in *Chloanthes*, of which they have the anthers, but the corollas as well as scattered non-decurrent leaves are those of *Pityrodia*.

1. **C. glandulosa**, *R. Br. Prod.* 514. An erect perennial or undershrub, nearly resembling *C. stœchadis*, but coarser and taller. Leaves lanceolate or linear-lanceolate, bullate-rugose and decurrent as in that species, but mostly  $1\frac{1}{2}$  to 3 in. long, the margins less revolute, and both sides muricate or hispid with short rigid glandular hairs, not white or woolly underneath. Flowers axillary,  $1\frac{1}{2}$  in. long, the calyx fully  $\frac{1}{2}$  in., the peduncles 3 to 4 lines long, with short linear bracts below the middle or near the base, the shape and structure of the flowers and fruits otherwise as in *C. stœchadis*.—*Schau. in DC. Prod.* xi. 531.

**N. S. Wales.** Grose river, *R. Brown*; Blue Mountains, *A. and R. Cunningham*. Further observations may possibly show this to be a luxuriant variety of *C. stœchadis*.

2. **C. stœchadis**, *R. Br. Prod.* 514. A perennial or undershrub, with erect simple or branched stems of 1 to 2 ft. Leaves opposite, linear or linear-lanceolate, but often almost terete owing to the revolute margins, obtuse, rarely above 1 in. long, exceedingly bullate-rugose and scabrous-muricate on the upper or outer surface, which is decurrent along the stem to the next pair of leaves, the under-surface woolly-white but often quite concealed by the revolute margins. Flowers "yellowish," on very short axillary pedicels, with a pair of linear bracteoles rugose like the leaves but shorter than the calyx, inserted about the middle of the pedicel. Calyx 4 to 5 lines long, more or less clothed with woolly hairs inside and out, divided to the middle or lower down into 5 lanceolate or linear herbaceous lobes, bullate like the leaves. Corolla in the typical form above 1 in. long, pubescent outside, the tube gradually dilated upwards, and slightly curved, glabrous inside except a ring of woolly hairs above the ovary, the upper lip erect, somewhat concave, with two short spreading lobes, the lower lip divided into three acute very spreading lobes, the middle one rather longer and more reflexed than the others. Ovary densely

villous. Fruit separating into two hemispherical reticulate hairy cocci, the exocarp membranous, the endocarp and placenta forming in each a bony 2-celled nut with 1 seed in each nut.—Schau. in DC. Prod. xi. 532; *C. lavandulifolia*, Sieb. in Spreng. Syst. ii. 756.

**N. S. Wales.** Heaths about Port Jackson, *R. Brown*, *Sieber*, n. 185 and 186, and many others.

Var. *parviflora*. Flowers smaller, but shaped like those of *C. stæchadis*, the corolla about  $\frac{3}{4}$  in. long.—Waverley hills, Sydney, *Mossman*; Woolloomooloo, *A. Cunningham*, and in some other N. S. Wales collections.

3. ***C. parviflora*, Walp. Rep. iv. 58.** An erect perennial or undershrub, with the habit and foliage of *C. stæchadis*, but the calyx is more deeply divided, and the corolla, not above  $\frac{1}{2}$  in. long, has the throat or upper portion of the tube broader and very hairy inside below the upper lip with long whitish hairs, the lobes are also much shorter and all obtuse. Stamens usually shorter than in *C. stæchadis*, but variable. Fruit as in *C. stæchadis*. The colour of the flower is uncertain, being variously described as purple, light blue, yellow, or yellowish.—Schau. in DC. Prod. xi. 532.

**Queensland.** Rockingham Bay, *Dallachy*.

**N. S. Wales.** In the interior, *Lhotsky* (*Schauer*). I have not seen the original specimens, but Walpers's character applies rather to this than to the small-flowered variety of *C. stæchadis*.

4. ***C. coccinea*, Bartl. in Pl. Preiss. i. 352.** An erect slightly branched undershrub or shrub of about 1 to 2 ft., the stems usually clothed with a white cottony wool, concealed however by the decurrent leaves. Leaves opposite or in whorls of three, narrow and nearly terete owing to the revolute margins, obtuse,  $\frac{1}{2}$  to 1 in. long, bullate-rugose with the tubercles very regular in three or four longitudinal rows, coriaceous, shining, slightly tuberculate or muricate and decurrent along the stem, the white cottony under surface usually completely concealed. Flowers scarlet according to Preiss, nearly sessile and axillary, but collected into short leafy spikes or heads at or near the summits of the branches. Pedicels not 1 line long, the linear bracteoles near the base. Calyx 4 to 5 lines long, deeply divided, hirsute with long white woolly hairs. Corolla-tube about  $\frac{1}{2}$  in. long, gradually dilated upwards, the lobes about 3 lines long, almost acute. Stamens exserted from the tube.—Schau. in DC. Prod. ix. 831.

**W. Australia,** *Drummond*, n. 97, 142; Hay district, *Preiss*, n. 2339.

Chiefly distinguished from the eastern *C. stæchadis* by the more rigid regularly bullate leaves, and by the inflorescence.

There is apparently a fifth species with decurrent leaves, of which the specimens from Depuech island, N.W. Coast, *Bynoe*, are in a state of very young bud, insufficient for description.

## 10. **PITYRODIA.** R. Br.

(*Quoya*, *Gaudich.* *Dasymalla*, *Endl.*)

Calyx more or less deeply 5-lobed. Corolla-tube broad, usually short, more rarely elongated; limb of 5 spreading lobes more or less distinctly 2-lipped, or oblique with the lowest lobe much larger than



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the others. Stamens 4, usually didynamous; included or shortly exserted; anther-cells all, or one of each anther, or those of one pair of anthers, tipped at the lower end by a small or very prominent appendage rarely entirely deficient. Ovary imperfectly or almost perfectly 2-celled, with 2 ovules in each cell laterally attached to a short or very long funicle. Style very shortly 2-lobed, and often dilated at the base of the lobes. Fruit a dry drupe, the endocarp separating into two 2-celled nuts with one seed in each cell, or reduced by abortion to one or two single-seeded nuts. Seeds ascending, with a thin testa and copious albumen.—Shrubs or undershrubs, more or less clothed with cottony wool. Leaves scattered or irregularly opposite, not decurrent. Flowers solitary, or in cymes or clusters, axillary or collected in terminal cymes or leafy spikes.

The genus is limited to Australia, differing from *Chloanthes* in foliage, in the corolla-tube usually shorter and much broader, and in the appendages to the anthers which are usually very distinct, although in a few species very much reduced or obsolete. The corolla also of some species is very nearly that of *Chloanthes parviflora*, but the peculiar foliage of the latter genus, which is constant, may be sufficient to maintain it as distinct.

Leaves oblong or lanceolate, the margins slightly recurved.

Calyx (not exceeding 3 lines), with lanceolate lobes.

Flowers axillary.

Leaves petiolate, lanceolate, very rugose, 1 to 2 in. long. Tomentum ferruginous . . . . .

1. *P. salvifolia*.

Leaves nearly sessile, mostly obtuse, under  $\frac{3}{4}$  in. long. Tomentum hoary or white . . . . .

2. *P. hemigenioides*.

Leaves linear or lanceolate with revolute margins, very rugose (as in *Chloanthes*) but not decurrent. Calyx (4 to 6 lines) with linear plumose lobes. Flowers . . . . . in spikes.

3. *P. uncinata*.

Leaves mostly linear, the floral ones exceeding the flowers . . . . .

4. *P. Bartlingii*.

Leaves mostly lanceolate, the floral ones not exceeding the flowers . . . . .

Leaves ovate oblong or lanceolate, flat thick and soft. Calyx (3 to 6 lines) with narrow or lanceolate lobes. Flowers usually in dense or interrupted spikes.

Calyx about 5 lines long, woolly-tomentose.

Corolla-tube shorter than the calyx; middle lobe twice as broad as the others . . . . .

5. *P. verbascina*.

Corolla-tube longer than the calyx, the three lower lobes broad . . . . .

6. *P. racemosa*.

Calyx scarcely 3 lines long, densely plumose-hairy. Corolla-tube not exceeding the calyx; middle lobe twice as broad as the others . . . . .

7. *P. Drummondii*.

Leaves without revolute margins. Calyx-lobes ovate oblong or spatulate, very obtuse.

Leaves very rugose, contracted below the middle but sessile and dilated at the base.

Corolla-tube much longer than the calyx, gradually dilated upwards . . . . .

8. *P. dilatata*.

Corolla-tube broadly campanulate, not much exceeding the calyx . . . . .

9. *P. cuneata*.

Leaves petiolate, broadly ovate or orbicular. Calyx-lobes enlarged and thin after flowering.

Very thickly woolly-tomentose. Calyx 6 to 8 lines long.

Corolla-lobes nearly of equal breadth . . . . . 10. *P. Oldfieldii*.

Hoary or white with a close tomentum. Calyx 3 to 5 lines long. Corolla with the lowest lobe twice as broad as the others

11. *P. atriplicina*.

Like *P. atriplicina*, but smaller, with a looser inflorescence and smaller flowers . . . . .

12. *P. paniculata*.

1. ***P. salvifolia***, *R. Br. Prod.* 513. A shrub of spreading growth, attaining 6 to 8 ft., with a strong sage-like scent, the branches densely clothed with a woolly tomentum usually rust-coloured, but sometimes whitish. Leaves opposite, shortly petiolate, lanceolate or almost linear, obtuse or rather acute, 2 to 3 or even 4 in. long, very rugose, pubescent above, cottony and rusty or whitish underneath. Flowers nearly sessile, in axillary clusters of 2, 3, or rarely more. Bracts very narrow, the outer ones shorter than the calyx, the inner ones much smaller. Calyx turbinate-campanulate, nearly 3 lines long, prominently ribbed, tomentose, divided to rather below the middle into lanceolate acuminate lobes. Corolla white, scarcely exceeding the calyx, the tube broadly campanulate, with a dense ring of hairs inside below the stamens; lobes shorter than the tube, the 2 upper ones rather more united, the middle lower one rather broader than the others. Filaments very short; anthers almost exerted, the two lower ones with prominent appendages, the two upper ones with shorter ones, and in one bud I found a fifth rudimentary stamen. Ovary glabrous; ovules attached close to the top with a short funicle. Fruit almost completely 4-celled.—*Schau.* in *DC. Prod.* xi. 628; *Premna salvifolia*, *Spreng. Syst.* ii. 755.

**Queensland.** Northumberland islands, *R. Brown*; barren rocky hills, Cleveland bay, *A. Cunningham*; near Rockhampton, *O'Shanesy*; near Mount Hedlow, *Dallachy*.

2. ***P. hemigenioides***, *F. Muell.* A rigid divaricate shrub of 1 to 3 ft., the branches cottony-white or woolly-tomentose. Leaves sessile or the larger ones shortly petiolate, narrow-ovate or oblong, rather crowded on the branches, obtuse, the margins recurved, rounded or cordate at the base, from about  $\frac{1}{4}$  to above  $\frac{1}{2}$  in. long, rather rigid, at first cottony-white but becoming glabrous and minutely rugose above, reticulate underneath. Flowers solitary, shortly pedicellate, or nearly sessile in the axils of the upper smaller leaves. Bracteoles linear, leafy. Calyx about 3 lines long, turbinate-campanulate, strongly ribbed, divided to much below the middle into lanceolate lobes. Corolla 5 to 6 lines long, the tube short and much dilated, the lobes about as long as the tube, the 2 upper ones shortly united, the middle lower one rather broader than the others. Stamens slightly exceeding the tube; anther-cells with minute appendages, one cell of each of the upper ones occasionally abortive. Ovary tomentose, ovules attached at or near the top by a very short funicle.—*Chloanthes hemigenioides* or *Quoya hemigenioides*, *F. Muell. Fragm.* vi. 156.

**W. Australia.** Northern districts, *Drummond*; Dirk Hartog's island, *Milne*.

**N. Australia.** A single specimen without flowers from *M'Douall Stuart's Expedition* appears to belong to this species.

3. ***P. uncinata***, *Benth.* An erect branching shrub of 1 to 2 ft., the branches covered with white cottony wool. Leaves crowded but not

decurent, scattered or in irregular whorls of three, linear or linear-lanceolate, usually tapering towards the end and often but not always terminating in a hooked blunt point, the margins recurved or revolute, more or less bullate-rugose, the half-concealed under surface woolly-white or nearly glabrous. Flowers solitary in the axils of the upper leaves, forming long leafy spikes, usually very woolly-hairy, the floral leaves mostly exceeding the flowers. Pedicels very short. Calyx about 4 lines long, deeply divided into narrow membranous hairy lobes, sometimes slightly bullate and muricate at the end. Corolla-tube scarcely  $\frac{1}{2}$  in. long, much dilated upwards and slightly incurved, the limb 2-lipped, half as long as the tube, the upper lip very shortly 2-lobed, the lower of 3 very spreading lobes. Stamens included in the tube or the lower ones shortly exserted. Anther-cells (all?) without any appendages. Ovary tomentose, without any hypogynous disk; ovules attached at or near the top, with a very short or scarcely any funicle.—*Chloanthes uncinata*, Turcz. in Bull. Soc. Imp. Nat. Mosc. 1863. ii. 194; *C. bullata*, F. Muell. Fragm. vi. 156.

**W. Australia**, Drummond, 4th coll. n. 160, J. S. Roe; Oldfield river, Maxwell.

Var. *exserta*. Coarser, the leaves mostly cordate and stem-clasping. Flowers rather larger, the stamens exserted.—Cape Arid, Maxwell.

This and the following species are usually placed in *Chloanthes*, and the anther-appendages, conspicuous in the majority of *Pityrodia*, are here very obscure, but the shape of the flowers as well as the scattered non-decurrent leaves appear to me to place them much better in the latter than in the former genus.

4. **P. Bartlingii**, Benth. Stems, from a woody base, 1 to 2 ft. high, densely clothed with white wool often intermixed with long soft hairs and sometimes turning to a reddish brown. Leaves scattered or in whorls of three, not much crowded, lanceolate or linear, the margins more or less revolute, bullate and hairy or nearly glabrous outside, more or less woolly-white underneath. Flowers solitary or 3 together on short peduncles in the axils of the upper leaves, which are always smaller and sometimes reduced to bracts, forming terminal spikes of 3 to 4 in., very hairy with long soft hairs, and either continuous or interrupted and more leafy at the base. Calyx divided to the base into linear or linear-lanceolate membranous hairy segments of 4 to 6 lines. Corolla usually about  $\frac{1}{2}$  in. long, very much dilated above the inner ring of woolly hairs into a broad campanulate throat but oblique and somewhat incurved, the lobes all short and broad. Stamens slightly exserted; anthers with minute obtuse appendages sometimes almost obsolete, the upper pair usually smaller than the lower. Ovary tomentose, the ovules attached near the top to exceedingly long flexuose filiform funicles.—*Chloanthes Bartlingii*, Lehm. Ind. Sem. Hort. Hamb. 1844; Bartl. in Pl. Preiss. i. 352; Schau. in DC. Prod. xi. 531.

**W. Australia**. Swan river and Darling range, Drummond, 1st coll. n. 447, Preiss, n. 2340, Oldfield and others.

The leaves are exceedingly variable, sometimes all narrow and under  $\frac{1}{2}$  in. long; in some large-flower 1 specimen lanceolate,  $1\frac{1}{2}$  in. long, not much revolute and very densely woolly underneath; in other specimens narrower and so much revolute as completely to conceal the wool. Some of Oldfield's specimens have very small leaves, the floral ones broad and almost ovate, with rather smaller flowers.

Some **Victorian** specimens, from near Swan Hill on the Murray, *W. Ross*, may belong to some *Pityrodia* allied to *P. uncinata* or *P. Bartlingii*, but being without flower or fruit they cannot be determined.

**5. *P. verbascina*, F. Muell.** A stout erect shrub, densely clothed as in *P. Oldfieldii* with cottony wool, often floccose and sometimes assuming a golden or orange-red hue in the upper part of the plant. Leaves opposite or in whorls of three, ovate or oblong, obtuse, sessile or contracted into a petiole, 1 to 2 in. long, very thick and soft, the veins concealed by the wool, the floral ones smaller, the upper ones shorter than the calyx. Flowers very shortly pedunculate, usually several together in the upper axils, forming a dense or interrupted more or less leafy spike. Bracts small or none. Calyx about 5 lines long, very woolly, very deeply divided into narrow 3-nerved segments. Corolla about  $\frac{1}{2}$  in. long, tomentose, the tube much dilated, the 2 upper lobes short and broad, the 2 lateral ones smaller and triangular, the lowest one very much larger and more than twice as broad as any of the others. Stamens included or shortly exserted; anther-appendages variable, usually one large one to one cell of each anther, the other cell without any or with a smaller one. Ovules attached at or near the top by a very short funicle. Fruit obovoid or depressed, often oblique, about  $1\frac{1}{2}$  lines long, usually ripening only 2 seeds (one to each carpel) but occasionally all 4 are enlarged.—*Chloanthes verbascina*, F. Muell. Fragm. i. 233; *Quoya verbascina*, F. Muell. Fragm. iv. 80.

**W. Australia.** Murchison river, *Oldfield*, *Drummond*, 6th coll. n. 140.

**6. *P. racemosa*, Benth.** An erect shrub or undershrub of about 2 ft., densely covered with white wool, sometimes loose and floccose, sometimes shorter and closer. Leaves opposite, oblong or oval, very obtuse, sessile and sometimes stem-clasping, mostly  $\frac{3}{4}$  to above 1 in. long, thick and soft, reticulate-rugose but the wrinkles concealed by the tomentum, and otherwise flat. Flowers "resembling in colour and in shape those of the garden sage," solitary or more frequently in cymes of 3 to 5, the peduncles very variable in length but always shorter than the leaves, forming an interrupted terminal leafy raceme. Bracts usually short. Calyx about 5 lines long, divided almost or quite to the base into 5 narrow membranous 3-nerved segments. Corolla nearly 1 in. long, the tube much dilated upwards, the 4 upper lobes nearly equal in length, broad, spreading, pubescent outside, the lowest twice as broad as the others and glabrous. Stamens as long as the tube or shortly exserted, the anther-cells linear, at length diverging, with short appendages. Ovules attached near the top, with short funicles. Fruit ripening, occasionally at least, all the four seeds.—*Quoya (?) racemosa*, Turcz. in Bull. Soc. Imp. Nat. Mosc. 1863. ii. 194; *Chloanthes stachyodes*, or *Quoya stachyodes*, F. Muell. Fragm. v. 50, vi. 158; *Dasy-mallu axillaris* and *D. terminalis*, Endl. Nov. Stirp. Dec. 11, 12.

**W. Australia.** *Drummond*, 3rd coll. n. 141, 5th coll. n. 73; near Mount Walter, *Herb. F. Mueller*, collector not named.



7. **P. Drummondii**, *Turez. in Bull. Soc. Imp. Nat. Mosc.* 1863. ii. 213. An undershrub with long erect slightly branched stems attaining 3 or 4 ft., the lower part of the stem and leaves usually loosely tomentose and more or less floccose, the upper part of the stem and sometimes the whole plant except the inflorescence and calyxes quite glabrous. Leaves opposite or in whorls of three, oval-oblong or lanceolate, obtuse, often irregularly crenate, contracted at the base, mostly  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long, rugose but otherwise flat, the floral ones very small or entirely wanting. Flowers small, whitish, in dichotomous cymes sometimes pedunculate and many-flowered, sometimes condensed into sessile opposite heads in distant pairs forming a long interrupted terminal raceme-like panicle. Calyx scarcely 2 lines long, divided to about  $\frac{3}{4}$  into linear membranous slightly unequal lobes, clothed outside with hairs sometimes very short, more frequently very long, repeatedly forked, soft and often assuming a purple hue. Corolla about 5 lines long, the tube very broad and oblique, the 2 upper lobes short and erect, the 2 lateral ones rather larger, the lowest twice as broad and longer than the others. Ovary glabrous or slightly woolly, usually with only 2 perfect ovules, each one attached to an exceedingly long filiform and several times folded funicle. Fruit not seen.—*Chloanthes loxocarpa*, F. Muell. Fragm. ii. 22; *Quoya loxocarpa*, F. Muell. Fragm. iv. 80.

**W. Australia.** Murchison river, Oldfield, Drummond, 6th coll. n. 141; Flinders' Bay, Collie.

The indumentum of the calyx and sometimes of the whole plant is exceedingly variable.

8. **P. dilatata**, F. Muell. A branching shrub, densely clothed with a white cottony wool, more or less floccose on the branches and calyxes, shorter on the leaves and sometimes disappearing from the old ones. Leaves obovate or oblong-spathulate, narrowed below the middle, dilated and stem-clasping at the base, thick and much bullate-rugose on the upper surface, reticulate underneath, otherwise flat or nearly so. Flowers all axillary, mostly solitary on short pedicels, forming sometimes a long interrupted leafy spike. Bracteoles short, linear. Calyx 4 to 5 lines long, divided to the base into 5 narrow somewhat spathulate membranous segments, very thickly woolly outside. Corolla 9 to 10 lines long, the tube gradually dilated upwards but scarcely more so than in some species of *Chloanthes*, upper lobes of the limb erect and acute, lateral ones reflexed, the lowest one rather larger than the others and reflexed. Upper pair of stamens about as long as the corolla-tube, lower pair longer; anther-cells with minute appendages. Ovary very densely villous on a small glabrous disk; ovules attached above the middle to rather long erect funicles or almost sessile and attached at or near the top. Fruit not seen.—*Chloanthes dilatata* or *Quoya dilatata*, F. Muell. Fragm. vi. 157.

**W. Australia**, Drummond, n. 210.

9. **P. cuneata**, Benth. A rigid divaricate shrub, densely clothed with cottony stellate or branched white or yellowish hairs, more woolly

and sometimes floccose on the branches, shorter and more scabrous on the leaves. Leaves opposite, obovate or cuneate, very obtuse, contracted below the middle, sessile and usually dilated or almost auriculate at the base,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, very thick and reticulate on both sides, quite flat or the margins recurved only at the narrow base. Flowers "blue," solitary or in pedunculate cymes of three, all axillary. Calyx-lobes ovate, obtuse, more or less distinctly arranged in two lips and about as long as the tube at the time of flowering, when in fruit more distinctly and deeply 2-lipped, membranous, reticulate and very woolly outside. Corolla exceeding the calyx, very broadly campanulate above the inner ring of hairs, the lowest lobe much broader than the others. Stamens shortly exceeding the corolla; anther-cells with short appendages at the base. Fruit woolly-hairy, rather above 1 line long, and broader than long, dividing into two 2-celled nuts, the cavity of their inner faces broad short and only slightly excavated.—*Quoya cuneata*, Gaud. in Freyc. Voy. Bot. 454, t. 66.

**W. Australia.** Sharks Bay, *Gaudichaud*; waste places, Sharks Bay, rare, *Milne*. The specimens examined being far advanced, the details of the flower are chiefly taken from *Gaudichaud*'s figure and description.

10. **P. Oldfieldii**, *F. Muell.* An erect shrub of 2 to 3 ft., the branches and leaves thicker and more densely tomentose-woolly or scabrous-hispid with branched hairs than in any other species except *P. verbasina*. Leaves opposite, broadly ovate obovate or almost rhomboidal, very obtuse, flat but the margins minutely undulate,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long, narrowed into a short petiole or almost sessile but not dilated at the base. Flowers "pink," solitary, or 3 together on very short axillary peduncles, rarely exceeding the leaves. Calyx 6 to 8 lines long, very thickly woolly, divided to nearly the middle, the lobes oblong, very obtuse, membranous, 3-nerved, reticulate, the two upper ones rather higher connate than the others. Corolla about  $\frac{3}{4}$  in. long, tomentose outside, much dilated, the lobes all broad and nearly equal. Anther-appendages very distinct. Ovary very woolly-hirsute; ovules attached at or near the top by very short funicles. Fruit not seen ripe.—*Chloanthes Oldfieldii*, *F. Muell. Fragm. i.* 234; *Quoya Oldfieldii*, *F. Muell. Fragm. iv.* 80, but not *Q. cuneata* Gaud., to which it is referred by *F. Muell. Fragm. vi.* 157.

**W. Australia.** Murchison river, *Oldfield*; *Drummond*, 6th coll. n. 139.

11. **P. atriplicina**, *F. Muell.* A tall much-branched shrub, white or hoary with a dense but close and short tomentum, sometimes looser and almost floccose on the branches. Leaves opposite, broadly ovate obovate or orbicular,  $\frac{1}{2}$  to above 1 in. diameter, contracted into a short petiole, the venation usually concealed by the tomentum. Flowers in the upper axils, in pedunculate cymes or rarely solitary, forming often a short broad leafy panicle. Bracts small. Calyx varying from 3 to 5 lines in length, the tube ovoid or turbinate, the lobes ovate or oblong, obtuse, shorter than the tube. Corolla 6 to 8 lines long, tomentose outside, much dilated, the lobes short and broad, the lowest



F. Schottel, Lith.

F. Mueller, direct.

F. Gracy & L. H. H. H. H.

*Bunya cyanocalyx*. F. M.



twice as large as the others and very broad. Anthers of the lower stamens with appendages to one or to both of the cells, of the upper stamens usually without appendages. Ovary densely tomentose, ovules attached at or near the top with very short funicles. Fruit not seen.—*Chloanthes atriplicina*, F. Muell. Fragm. i. 235; *Quoya atriplicina*, F. Muell. Fragm. iv. 80.

**W. Australia.** Murchison river, *Oldfield*; *Drummond*, 6th coll. n. 138; Sharks Bay, *Maitland Brown*.

12. **P. paniculata**, F. Muell. Evidently nearly allied to *P. atriplicina*, with the same close white indumentum, and perhaps a variety or even a different state only of the same species, but only known from a small fragment, showing looser cymes with very small oblong floral leaves and smaller flowers, the calyx rather more deeply divided into oblong-spathulate or almost obovate lobes. The structure of the flowers appears to be the same as that of *P. atriplicina*.—*Chloanthes paniculata*, or *Quoya paniculata*, F. Muell. Fragm. iv. 80.

**W. Australia.** Sharks Bay, *Maitland Brown* (*Herb. F. Muell.*).

## 11. CYANOSTEGIA. Turczan.

(*Bunnya*, F. Muell.)

Calyx broadly campanulate, expanding after flowering, opening very flat, membranous, reticulate, the margin sinuate-toothed or 5-lobed. Corolla broadly campanulate, glabrous inside, the limb 5-lobed, the 2 upper lobes rather longer than the 3 lower. Stamens 4, inserted near the base of the corolla; anthers large, oblong, without appendages. Ovary small, depressed, 2-celled, with 2 ovules in each cell laterally attached; style elongated, minutely and often unequally 2-lobed. Fruit in the centre of the enlarged calyx, small, hard, usually more or less oblique, and ripening 1 or 2 ascending or oblique seeds, resembling those of *Chloanthes* and *Pityrodia*.—Glabrous and apparently glutinous shrubs. Leaves opposite, undivided, not decurrent, the upper floral leaves reduced to small bracts. Peduncles axillary, 1- or 3-flowered, forming a loose terminal panicle. Bracteoles small.

The genus is limited to Australia, and nearly allied to the two preceding ones though without any cottony wool.

Leaves linear, often folded lengthwise . . . . .	1. <i>C. angustifolia</i> .
Leaves lanceolate, flat . . . . .	2. <i>C. lanceolata</i> .
Leaves cuneate-oblong . . . . .	3. <i>C. Bunnya</i> .

**C. angustifolia**, Turcz. in *Bull. Soc. Imp. Nat. Mosc.* 1849, ii. 36.

erect glabrous shrub, the upper part often appearing glutinous. Leaves linear, obtuse or with a short hooked point, flat or concave with the margins folded inwards, often bordered by small distant teeth, 1 to 2 in. long, rather thick and nerveless, the floral ones much smaller, the upper ones reduced to small bracts. Peduncles opposite, the upper ones usually short, 1-flowered, with a pair of small bracteoles under the calyx, the lower ones often 3-flowered or growing out into a flowering branch, the whole forming a loose pyramidal panicle. Calyx

at the time of flowering not much longer than the corolla, when expanded under the fruit as much as  $\frac{3}{4}$  in. diameter, pubescent outside, of a blueish hue, irregularly sinuate-toothed or more deeply and broadly 5-lobed. Corolla nearly 3 lines long, apparently purple, pubescent outside, the lobes shorter than the tube. Anthers shortly protruding. Fruit not seen perfect.—*C. intermedia*, Turcz. l. c.

**W. Australia**, Drummond, 3rd coll. n. 140, 4th coll. n. 161.

2. ***C. lanceolata***, Turcz. in Bull. Soc. Imp. Nat. Mosc. 1849, ii. 35. An erect glabrous shrub closely allied to *C. angustifolia*, and united with it by F. Muell. Fragm. vi. 154, under the name of *C. Turczaninovi*, but the leaves, in the numerous specimens seen, are constantly lanceolate and flat, varying from 1 in. to above 2 in. in length. Flowers rather larger and more numerous than in *C. angustifolia*. Fruit small, hard, depressed, hirsute with long branched hairs, most frequently 1-seeded.

**W. Australia**, Drummond, (1st coll. ?) n. 440, 3rd coll. n. 139.

3. ***C. Bunnyana***, F. Muell. Fragm. v. 36. An erect glabrous and apparently glutinous shrub of 3 to 4 ft. closely resembling the two other species, except that the leaves are cuneate-oblong and slightly toothed towards the end, and the flowers form a very long narrow panicle in the few specimens seen. Calyx quite glabrous outside, and usually more entire than in the other species, but some calyxes of *C. angustifolia* are in like manner only slightly sinuate-toothed. Fruit hirsute with branched hairs as in *C. lanceolata*.—*Bunnya cyanocalyx*, F. Muell. Fragm. v. 36, t. 39.

**N. Australia**. Roebuck Bay, N.W. Coast, Martin.

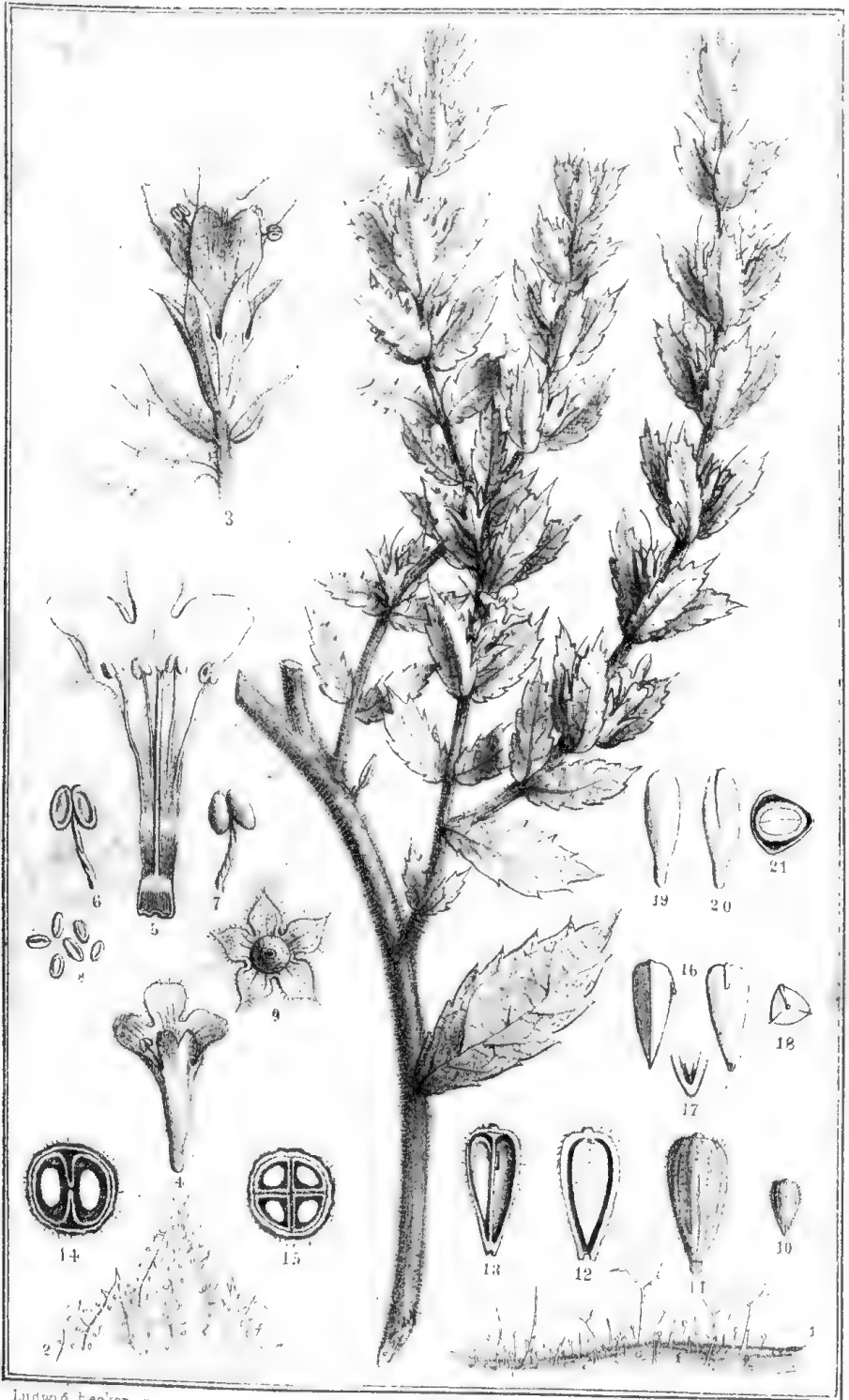
The three species, as suggested by F. Mueller, may prove to be forms of one very variable species, but as yet we have no intermediates.

## 12. DENISONIA, F. Muell.

Calyx 10-ribbed, divided to the middle into 5 narrow lobes, not much enlarged after flowering. Corolla-tube not much dilated, limb 2-lipped, the upper lip erect with 2 spreading lobes, the lower lip 3-lobed, spreading. Stamens 4, inserted above the middle of the tube, shortly exserted; anther-cells divergent, without appendages. Ovary 2-celled, with 2 ovules in each cell laterally attached near the top. Style filiform, very shortly 2-lobed. Fruit dry, 4-celled, the endocarp separating into two 2-celled nuts. Seed solitary in each cell, albuminous.—Aromatic shrub, scarcely tomentose. Leaves in whorls of 3 or scattered, not decurrent. Flowers solitary in the axils, on short pedicels, with a pair of bracteoles under the calyx.

The genus is limited to a single species, endemic in Australia and scarcely differing from *Chloanthes*, except in the non-decurrent leaves.

1. ***D. ternifolia***, F. Muell. Fragm. i. 124, t. 2. An erect shrub of several ft. with a strong aromatic odour, the branches virgate, clothed with a short glandular tomentum intermixed with long slightly



Ludwig Becker del. & sculp.

Lado & Carrage.

*Denisonia ternifolia*. W.M. 1854. p. 54













branched spreading hairs. Leaves sessile, ovate to lanceolate, acute and mucronate, bordered by acute mucronate teeth,  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long, rigid but not thick, sprinkled with short hairs, nearly smooth above, with very strong raised veins and reticulations underneath. Flowers shorter than the leaves, the bracteoles linear, acute. Calyx narrow campanulate, about 4 or at length 5 lines long, the lobes lanceolate, acute. Corolla-tube rather shorter than the calyx, hairy inside below the insertion of the stamens; the upper lip usually shorter than the lower, and the middle lower lobe usually but not always elongated. Ovary tomentose at the top. Fruit oblong, attenuate at the base, nearly 2 lines long, tomentose. Seeds narrow, tapering at the base.

**N. Australia.** Towards the sources of the Seven-Emu and M'Arthur rivers, Gulf of Carpentaria, *F. Mueller*.

### 13. SPARTOTHAMNUS, A. Cunn.

Calyx very open, 5-lobed. Corolla-tube short and broad; limb spreading, 5-lobed, the middle lower lobe rather larger than the others. Stamens 4, exserted; anther-cells with minute tips at the lower end. Style filiform, with 2 rather long branches. Ovary imperfectly 2-celled, with 2 ovules in each cell laterally attached at or above the middle. Fruit a small globular succulent drupe, the endocarp separating into 4 1-seeded pyrenes, usually separated at the base by a central cavity. Seeds albuminous.—Shrub or undershrub, with few small distant leaves, all opposite and not decurrent. Flowers very small, solitary in the axils, with small bracteoles.

The genus is limited to a single species, endemic in Australia, very nearly allied to *Pityrodia*, but with a different habit, and differs from all the preceding genera by its succulent drupe, and from the following ones by its albuminous seeds and solitary flowers.

1. **S. junceus**, *A. Cunn. in Loud. Hort. Brit.* 600, and in *Walp. Rep.* vi. 694. An undershrub or shrub of several ft., glabrous or pubescent with branching hairs, the branches divaricate, rigid, acutely 4-angled, broomlike and appearing almost leafless, the smaller branchlets often 2 or 3 together at the nodes. Leaves small and distant, often reduced to small scales, all opposite, when more developed especially on young shoots  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long, lanceolate or ovate-lanceolate, entire or with a few coarse teeth, the margins recurved. Flowers very small, on short pedicels with 2 small bracteoles about the middle. Calyx about 1 line long. Corolla shortly exceeding the calyx, the tube broad, with a ring of short hairs inside near the top, the lobes rather longer than the tube. Ovary glabrous. Fruit quite smooth, (orange-red?), 1 to 2 lines diameter.—*A. DC. Prod.* xi. 705.

**Queensland.** Brisbane river, Moreton Bay, *A. Cunningham*; Sutter range and Burnet river, *F. Mueller*; Wide Bay, *Leichhardt*; Cape and Isaacs rivers, *Bowman*; sandstone ridges of the interior, *Mitchell*; Armadilla, *Barton*.

**N. S. Wales.** Sterile country, Mount Aiton, Peel's Range, *A. Cunningham*; Macleay and Clarence rivers, *Beckler*; New England, *C. Stuart*.

This plant had been placed in *Myoporinæ* and retained there by *A. De Candolle*

(who had no specimens in an examinable state) owing to Walpers having erroneously described the radicle as superior. F. Mueller, in referring it correctly to Verbenaceæ (Frœgm. vi. 153) adduces *Teucrium*, Hook f. from New Zealand, as a second species, which however can scarcely be admitted—the anthers and lobed ovary and fruit of the latter plant showing a nearer relation to *Oreva* and a few other genera which connect Verbenaceæ with the tribe Ajugoideæ of Labiatæ. The albuminous seeds branching hairs and other characters of *Spartothamnus* are quite those of Chloanthææ.

**SUBTRIBE 2. EUVITICEÆ.**—Ovary not at all or scarcely lobed. Fruit a drupe. Shrubs or trees. Flowers in cymes or clusters, axillary or in terminal corymbose or racemose panicles. Seeds without albumen, (or with a scanty albumen in some species of *Vitex*?).

#### 14. **CALLICARPA**, Linn.

Calyx truncate or 4- rarely 5-toothed. Corolla with a short tube, the limb spreading, of 4, rarely 5, lobes, nearly equal. Stamens 4, rarely 5, shortly exserted. Ovary 4-celled, with 1 ovule in each cell laterally attached at or above the middle; style filiform, dilated and truncate or very shortly 2-lobed. Fruit a small succulent drupe, the endocarp of 4 distinct 1-seeded nuts or pyrenes. Seed without albumen.—Shrubs, rarely undershrubs, more or less cottony or woolly with stellate hairs or rarely glabrous, and often with numerous resinous glandular dots especially on the under side of the leaves. Leaves opposite, undivided. Flowers small, in axillary cymes, with very small bracts.

A considerable tropical and subtropical genus, chiefly Asiatic, with a few African and American species. Of the three Australian species two are widely dispersed over the Indian Archipelago, one of them extending to the Khasia mountains and the other at least to the Malayan Peninsula; the third, supposed to be endemic in Australia, is also perhaps not sufficiently distinct from another Asiatic species. The genus is most readily distinguished from *Premna* by the inflorescence, and by the flowers more regular with isomerous stamens. The differences in the fruit may not be constant.

- |   |                            |
|---|----------------------------|
| Leaves acute at the base, glabrous above, white-tomentose underneath. Cymes dense. Corolla glabrous . . . . .   | 1. <i>C. cana</i> .        |
| Leaves rounded at the base, pubescent or velvety above, somewhat floccose underneath. Cymes dense. Corolla glabrous or nearly so, lilac or purple . . . . . | 2. <i>C. pedunculata</i> . |
| Leaves acute at the base, green on both sides. Cymes very loose. Corolla densely pubescent, white . . . . .   | 3. <i>C. longifolia</i> .  |

1. ***C. cana*, Linn. Mant. 198.** A “small shrub,” the tomentum close and short, usually white, slightly floccose on the older branches. Leaves petiolate, ovate, very shortly acuminate; bordered by rather broad more or less mucronate teeth, acutely narrowed at the base, 2 to 3 in. long in most of the Australian specimens, much larger and more acuminate in those from the Indian Archipelago, glabrous above when full-grown except a slight tomentum on the principal veins which is rather more abundant in R. Brown’s specimens, membranous when large, rather firmer and more rugose when small, white-tomentose underneath. Flowers small, in rather dense cymes, the common peduncle usually about as long as the petiole. Calyx about  $\frac{3}{4}$  line long,







minutely 4- or 5-toothed. Corolla glabrous, twice as long as the calyx. Stamens exserted; anthers with small glands along the connectivum. Drupe depressed-globular, not above 1 line diameter, slightly succulent, the endocarp of 4 hard nuts.—Schau. in DC. Prod. xi. 643; *C. adenanthera*, R. Br. Prod. 513.

**N. Australia.** Victoria river, *F. Mueller*; Groote Island, Gulf of Carpentaria, *R. Brown*.

**Queensland,** *Bowman*; Edgecombe Bay and Port Denison, *Dallachy*; Gilbert river, *Daintree*.

The species extends over the Indian Archipelago to the Malayan peninsula and the Philippine islands. The Timor and Javanese specimens, correctly referred here by Schauer, differ but slightly from the Australian ones in their larger more acuminate leaves. The figure in Bot. Mag. t. 2107, represents a much more woolly plant, but is perhaps a variety only. *C. bicolor*, Juss., Schau. in DC. Prod. xi. 642, and *C. erioclona*, Schau. l. c. 643, appear to me both to be precisely the common Archipelago form of *C. cana*. The *C. adenanthera* referred by Schauer with doubt to *C. longifolia* Lam. appears to me to be the true *C. cana*.

2. ***C. pedunculata*, R. Br. Prod. 513.** A shrub of 3 or 4 ft., with the tomentum rather loose and more or less floccose on the branches. Leaves petiolate, ovate or ovate-lanceolate, acuminate with the point often rather long, rounded or scarcely contracted at the base, usually 3 or 4 in. long in the Australian specimens, soft green and velvety with scattered hairs above, more tomentose underneath but not very white. Cymes rather loose, the peduncle often shortly exceeding the petiole. Flowers of *C. cana*, the corolla purplish or lilac. Fruit usually much larger than in that species, the succulent drupes often at least  $1\frac{1}{2}$  lines diameter, purple when fresh.—*C. dentata*, Roth? in Wall. Cat. n. 6319, but probably not the true plant of Roth; *C. lanata*, Schau. in DC. Prod. xi. 644, not of Lam.

**Queensland.** Northumberland islands, Broad Sound and Shoalwater Bay, *R. Brown*; Endeavour river, *A. Cunningham*; Dawson river, *F. Mueller*; Rockingham Bay and Rockhampton, *Dallachy* and others; Brisbane river, Moreton Bay, *W. Hill*, *F. Mueller* and others.

**N. S. Wales.** Clarence river, *Beckler*; Tweed river, *C. Moore*.

The species is also in the Archipelago, and is closely allied to the widely diffused *C. macrophylla*, Vahl. Schauer refers it to "*C. lanata*, Vahl. Symb. iii. 13," but, if he had turned to the page he quotes, he would have seen that the name is Linnæus', not Vahl's, and relates to the very different Ceylon species which Schauer has published as new under the name of *C. Wallichiana*.

3. ***C. longifolia*, Lam. ex. Schau. in DC. Prod. xi. 645, but not *C. adenanthera*, R. Br.** A shrub of several ft., the tomentum short, not so abundant as in most species and rarely whitish, although sometimes reddish on the young shoots. Leaves petiolate, oblong or oblong-lanceolate, acuminate with a long point, serrate, much narrowed at the base, 4 to 6 in. or even longer, membranous, green and nearly glabrous or sprinkled with very short hairs above, more copiously tomentose and glandular underneath but usually green or very slightly rusty or whitish. Flowers "white," smaller than in the other species, in very loose repeatedly forked cymes, the common peduncle scarcely exceeding the petiole, but the branches elongated and slender. Calyx about  $\frac{1}{2}$  line

long. Corolla about 1 line, pubescent outside. Fruit globular, white, about 1 line diameter.

**Queensland.** Rockingham Bay, *Dallachy*.

The species is widely spread over the Indian Archipelago, extending into India to Khasia and East Bengal.

## 15. *PREMNA*, Linn.

Calyx truncate or sinuately toothed. Corolla-tube short, the limb of 3, 4 or rarely 5 short teeth or lobes, nearly equal or slightly 2-lipped. Stamens 4, shorter than the corolla or rarely exserted. Ovary 4-celled, with 1 ovule in each cell laterally attached at or above the middle. Style filiform, with 2 short acute stigmatic lobes. Fruit a small succulent drupe, with a hard 4-celled undivided kernel. Seeds solitary in each cell, without albumen.—Shrubs or trees. Leaves opposite, undivided. Flowers small, in terminal trichotomous panicles, or in opposite cymes or clusters forming a terminal spike-like thyrsus.

A considerable genus, limited to the tropical and subtropical regions of the Old World. Although some, especially among the Asiatic species, are very well marked, there are a number of forms including the *P. integrifolia* and *P. serratifolia* of Linnæus which seem to pass into each other by numerous intermediates, and it would require a much more detailed study of good specimens from different localities than can now be devoted to them, to determine whether or not they can be classed into tolerably distinct races. To these would belong the first two of the following Australian forms here regarded as species, the next two are rather more distinct and apparently endemic; the fifth, also endemic, is a much more marked one.

Calyx very shortly and obtusely 3 lobed or obscurely 2-lipped.

Leaves very obtuse. Corolla-tube scarcely exceeding the calyx . . . . . 1. *P. obtusifolia*.

Leaves shortly acuminate. Corolla-tube nearly twice as long as the calyx . . . . . 2. *P. integrifolia*.

Calyx with a somewhat expanded obscurely toothed margin.

Leaves acuminate, thin, glabrous, the petiole short . . . . . 3. *P. limbata*.

Calyx 5-toothed, the margin not dilated.

Leaves ovate, acuminate, on rather short petioles . . . . . 4. *P. Dallachiana*.

Leaves deltoid, much acuminate (Poplar-like), on long petioles . . . . . 5. *P. acuminata*.

1. *P. obtusifolia*, *R. Br. Prod.* 512. A shrub of 3 to 6 feet, glabrous in the typical form except a minute pubescence on the inflorescence and sometimes a row of hairs along the principal veins on the underside of the leaves. Leaves broadly ovate obovate or almost orbicular, usually broadly obtuse, very rarely with a short obtuse point, cordate or very obtuse at the base, mostly 3 to 6 in. long and sometimes nearly as broad, the petiole varying from  $\frac{1}{4}$  to 1 in. in length. Flowers white or greenish, often very numerous, in terminal trichotomous corymbose panicles, sometimes shorter than the leaves, sometimes 6 to 8 in. diameter. Bracts very small and narrow. Calyx rarely above 1 line long and usually rather shorter, obscurely and irregularly 2-lipped, or rather very shortly and broadly 3-lobed, the upper lobe broader than the others and entire or obscurely 3-toothed, the two lower lobes entire, the whole calyx spreading open under the fruit but not otherwise enlarged. Corolla-tube about as long as the calyx, very hairy inside at the throat, the limb as long as the tube,





4-lobed, the upper inner lobe rather larger and less spreading than the others. Stamens inserted in the throat and nearly as long as the lobes. Style with very short stigmatic lobes. Drupe 2 to 2½ lines diameter. —Schau. in DC. Prod. xi. 637; *P. glycyococca*, F. Muell. Fragm. iii. 36.

**N. Australia.** Islands of the Gulf of Carpentaria and shores of the mainland, *R. Brown, Henne, Hulse.*

**Queensland.** Rockingham Bay, *Dallachy*; islands off the coast from Cape York to Cape Flattery, *F. Mueller, W. Hill, Henne.*

Very closely allied to some maritime forms of *P. integrifolia* but the leaves more obtuse, of a firmer consistence, and the corolla tube shorter. These characters may not however prove constant.

*P. attenuata*, R. Br. Prod. 512, Schau. in DC. Prod. xi. 637, may possibly be a variety of *P. obtusifolia*, with leaves of the same consistence and equally obtuse and a similar inflorescence, but the leaves are narrow-obovate or oblong and cuneate or narrowed at the base. There is however in Brown's herbarium only a single specimen in fruit from the N. Coast, insufficient for determining whether it be really distinct.

Var. ? *velutina*. Leaves softly tomentose on both sides, otherwise the foliage and flowers quite those of *P. obtusifolia*—Rockingham Bay, *Dallachy*, who notes that it is a small tree with a spreading head.

2. ***P. integrifolia*, Linn. ? var.** A tree or shrub, either quite glabrous or with a slight pubescence on the foliage and inflorescence. Leaves ovate, shortly acuminate, broad or rather narrow, usually rather smaller than in *P. obtusifolia*. Inflorescence and calyx entirely as in that species, but the corolla (in the Australian form) larger, the tube nearly twice as long as the calyx.—*P. ovata* and *P. media*, R. Br. Prod. 512; Schau. in DC. Prod. xi. 637.

**N. Australia.** Islands of the Gulf of Carpentaria, *R. Brown.*

The specimens I saw in Brown's herbarium did not appear to me to be at all different from some Asiatic ones of *P. integrifolia*, a very common sea-coast plant united by Schauer in DC. Prod. xi. 632 with *P. serratifolia*, Linn., under the latter name, which however appears to be the least appropriate of the two Linnæan ones for the consolidated species. The whole question however of the species of *Premna* requires a thorough revision.

3. ***P. limbata*, Benth.** A climbing shrub (*Dallachy*), the young branches and inflorescence minutely tomentose. Leaves ovate, mostly acuminate, rounded or broadly cordate at the base, 4 to 6 in. long, membranous, glabrous or pubescent along the veins underneath, the petioles 1 in. long or more. Panicles trichotomous, but not so spreading as in *P. obtusifolia* and the flowers larger, the pedicels often above 1 line long. Calyx fully 1 line long, the margin slightly expanded into broad very short obtuse or retuse teeth. Corolla-tube twice as long as the calyx, the upper inner lobe not much larger than the others.

**Queensland.** Rockingham Bay, *Dallachy.*

4. ***P. Dallachyana*, Benth.** A fine spreading shrub (*Dallachy*), the younger branches and inflorescence minutely tomentose, the older branches glabrous with a light-coloured bark, the foliage usually drying black. Leaves ovate, acuminate, entire, obtuse or narrowed at the base, mostly 2 to 3 in. long, glabrous or scarcely pubescent along the principal veins underneath. Panicles trichotomous, corymbose, not

large. Calyx scarcely 1 line long, more or less distinctly 5-toothed, the teeth very short, acute or obtuse but not dilated. Corolla-tube twice as long as the calyx and considerably dilated upwards, hairy inside at the throat, the lobes broad, the upper inner one larger than the others but entire. Stamens usually longer than the corolla. Drupe depressed-globular, not usually exceeding the calyx.

**Queensland.** Port Denison and in the scrub about Edgcombe Bay, *Dallachy*; Fort Cooper, *Bowman*. The calyx-lobes are more obtuse and irregular in the Edgcombe Bay specimens than in the others.

**5. *P. acuminata*, R. Br. Prod. 512.** A small tree of spreading habit, the inflorescence and foliage more or less hoary with a short close tomentum. Leaves broadly cordate-ovate, deltoid or almost rhomboidal, acuminate, entire or coarsely and irregularly toothed, 2 to 4 in. long, more or less pubescent or tomentose on both sides, 3- or 5-nerved (the first and often the second pair of primary veins starting from the base of the midrib), the petioles usually more than half as long as the leaves. Panicles very loose, the primary branches trichotomous, the ulterior ones dichotomous, the whole panicle sometimes 8 to 10 in. broad. Flowers nearly sessile. Calyx tomentose, nearly  $1\frac{1}{2}$  lines long, shortly and obtusely 5-toothed but the 3 upper teeth usually smaller and sometimes united as in *P. obtusifolia*. Corolla-tube shortly exserted, the lobes ovate, shorter than the tube, the upper inner one not very different from the others. Drupe depressed-globular, about 2 lines diameter.—Schau. in DC. Prod. xi. 637; F. Muell. Fragm. iii. 36; *P. cordata*, R. Br. l. c.; Schau. l. c.

**N. Australia.** Islands of the Gulf of Carpentaria and adjoining mainland, *R. Brown*, *Henne*; Point Cunningham, Cygnet Bay, N. W. coast, and Goulburn islands, *A. Cunningham*; Victoria river, *F. Mueller*; Escape Cliffs, *Hulse*; also from *M. Douall* *Stuart's Expedition*.

The species is readily distinguished by its Poplar-like foliage and loose inflorescence.

## 16. CLERODENDRON, Linn.

Calyx campanulate or inflated, 5-toothed or 5-lobed, enlarged and spreading under the fruit (except in *C. hemiderma* and in some species not Australian). Corolla-tube slender, often very long; limb spreading, nearly equally 5-lobed. Stamens 4, exserted and often very long. Ovary 4-celled, with 1 ovule in each cell laterally attached at or above the middle. Style filiform, with 2 short acute stigmatic lobes. Fruit a more or less succulent or almost dry drupe, the endocarp separating into 4 one-celled or rarely into 2 two-celled pyrenes.—Trees or shrubs or rarely herbs or woody climbers. Leaves opposite or in whorls. Flowers in loose heads or cymes, usually forming terminal corymbose or thyrsoid panicles or rarely axillary.

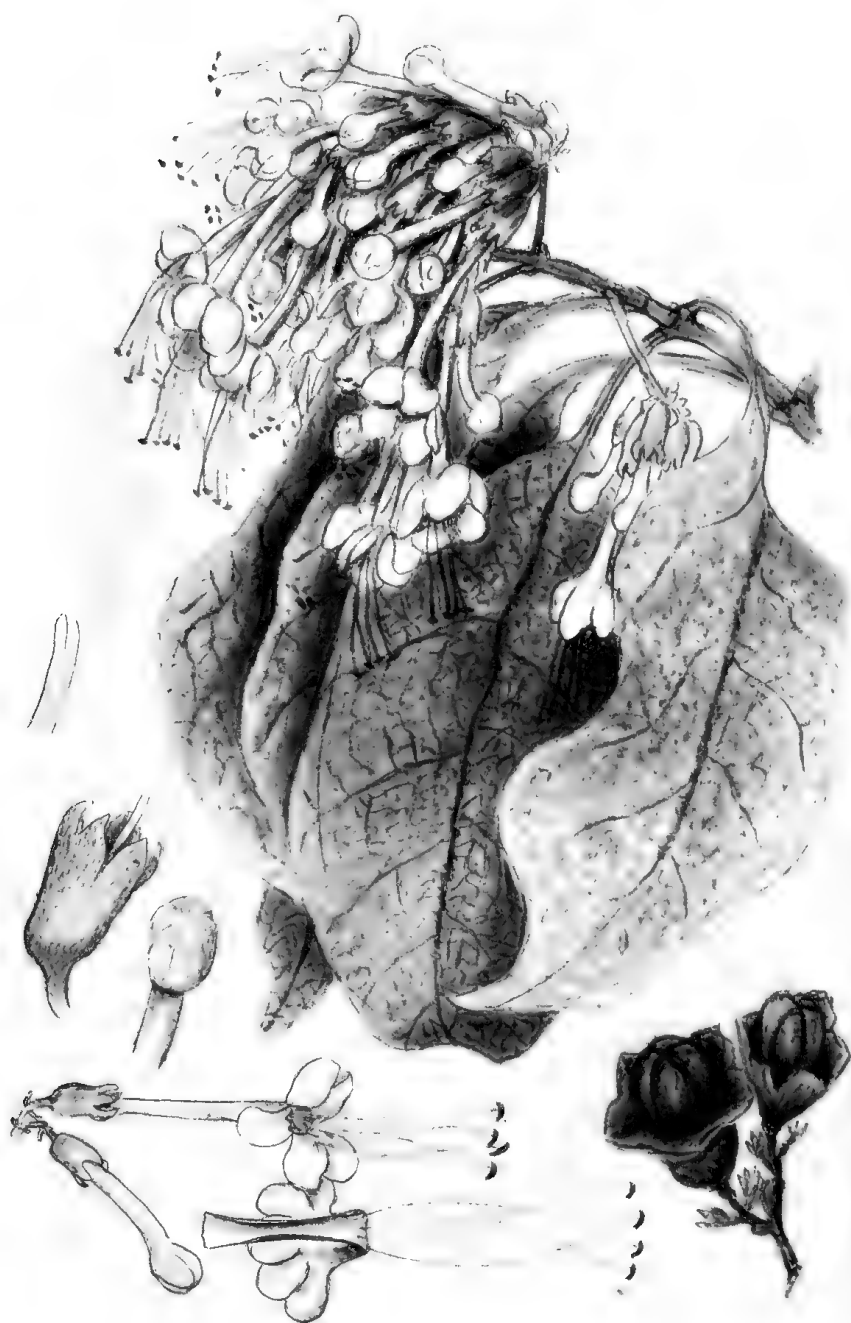
A considerable tropical genus, chiefly Asiatic, with a few African or American species. Of the Australian species—which are here limited to eight, but might almost equally well be raised to ten or eleven, or reduced to four or five—one is a sea-coast plant widely spread over tropical Asia, the others appear to be endemic.











Calyx minutely toothed.

Woody climber. Flowers small in compact cymes. Corolla-tube 3 lines long. Fruit oblong, pubescent, small. . . . 1. *C. hemiderma*.

Erect shrub. Flowers few in axillary loose cymes. Corolla-tube 1 in. long. Fruit obovoid, glabrous, rather large . . . . 2. *C. inerme*.

Calyx 5-lobed to the middle.

Corolla-tube about 3 lines long. Stamens shortly exserted.

Leaves large and broad . . . . 3. *C. Tracyanum*.

Corolla-tube  $\frac{3}{4}$  to nearly 1 in. long. Stamens long. Leaves usually tomentose.

Leaves usually broad. Flowers mostly in dense terminal corymbs . . . . 4. *C. tomentosum*.

Leaves usually narrow. Flowers mostly in axillary cymes . . . . 5. *C. lanceolatum*.

Corolla-tube 1 to  $1\frac{1}{2}$  in. long. Stamens long. Leaves usually glabrous or tomentose only when young . . . . 6. *C. floribundum*.

Corolla-tube 2 in. long or more. Stamens long. Leaves of *C. floribundum* . . . . 7. *C. Cunninghamii*.

Species insufficiently known, with broad tomentose, very rugose leaves . . . . 8. *C. costatum*.

1. **C. hemiderma**, *F. Muell.* A tall woody climber, the young parts and inflorescence more or less hoary-pubescent, the leaves becoming glabrous when full-grown. Leaves shortly petiolate, broadly ovate, obtuse or shortly and obtusely acuminate, mostly 2 to 3 in. long, green on both sides. Flowers small for the genus, numerous, in rather compact trichotomous cymes either terminal or on short branches or leafless divaricate peduncles in the upper axils. Primary bracts sometimes oblong-lanceolate and contracted into a petiole, but most of them very small and narrow. Calyx shortly pedicellate, narrow-campanulate or obovoid, about  $1\frac{1}{2}$  lines long, with 5 minute teeth. Corolla-tube slender, shortly exserted but not exceeding 3 lines, glabrous inside; lobes about half as long as the tube, more or less silky-pubescent outside. Stamens about twice as long as the corolla-lobes. Fruiting calyx often above 2 lines long but remaining narrow. Fruit oblong, obtuse, pubescent or hirsute, 3 to 4 lines long, 4-celled in the upper portion where the endocarp closes round the seeds and separates into 4 narrow nuts, the lower seedless portion assuming the appearance of a wing to each nut, whilst the lower portion of the dissepiment remains attached to the receptacle after the nuts have fallen in a cuneate-oblong shape three-toothed at the top and nearly as long as the calyx.—*C. (Hemiderma) Linnæi*, *F. Muell. Fragm. vi. 151*, not of Thwaites.

**Queensland.** Cape York, *Daemel*; Rockingham Bay, *Dallachy*; Selheim river, *Bowman*; Rockhampton, *Thozet*.

This plant has a singular resemblance with the Cingalese *C. Linnæi*, Thw. which has the same climbing habit, foliage, and inflorescence, but rather larger flowers, the outer bracts much larger, broader, and foliaceous, and the fruit, although nearly similar in shape, is much more normal, without the flat winglike bases of the nuts or the persistent axis upon which *F. Mueller* has founded his sectional character of *Hemiderma*.

2. **C. inerme**, *R. Br. Prod. 511.* A shrub attaining 6 ft. or more, glabrous or the young shoots slightly pubescent, the branches sometimes dilated and hardened at the base of the leaves, but not spinescent. Leaves on rather long petioles, ovate or elliptical, obtuse or shortly

acuminate, entire, mostly 2 to 3 in. long. Peduncles axillary, often nearly as long as the leaves, bearing usually 3, but sometimes a cyme of 7 or even more pedicellate flowers. Bracts minute. Calyx campanulate, slightly dilated on the margin, truncate and minutely toothed, more open and 3 lines long when in fruit. Corolla-tube about 1 in. long, the lobes about 4 lines. Stamens protruding about 1 in. beyond the throat. Drupe obovoid, usually about  $\frac{1}{2}$  in. long, but sometimes much larger, the exocarp thick and spongy or almost corky, with a crustaceous endocarp. Seeds with thick cotyledons and a very short radicle.—Schau. in DC. Prod. xi. 660.

**N. Australia.** Islands of the Gulf of Carpentaria, *R. Brown*; Albert river, *F. Mueller*; Port Essington, *Armstrong*; Adams Bay, *Hulls*.

**Queensland.** Bay of Inlets and Endeavour river, *Banks and Solander*; frequent along the coast from Cape York to Rockhampton, *A. Cunningham*, *M'Gillivray*, *F. Mueller*, *Dallachy*, and many others.

**N. S. Wales.** Richmond river, *Henderson*.

**3. C. Tracyanum**, *F. Muell.* A tall shrub or small tree, rather bare of foliage, the young branches foliage and inflorescence more or less velvety-pubescent or hirsute. Leaves broadly ovate, shortly acuminate, rounded or broadly cordate at the base, 4 to 8 in. long or more, on petioles of 1 to 4 in. Flowers in terminal trichotomous cymes, very dense at the time of flowering, 3 to 4 in. diameter when in fruit. Bracts very small and deciduous. Calyx shortly pedicellate, villous outside glabrous inside, turbinate-campanulate and about  $2\frac{1}{2}$  lines long at the time of flowering, divided to near the middle into acute lobes, enlarged and coloured after flowering, in some specimens with the fruit apparently ripe broadly campanulate and about 4 lines diameter, in others still more enlarged and opening almost flat to about 5 lines diameter. Corolla-tube above 3 lines long, slender and the 5 lobes of the limb nearly equal and spreading as in the rest of the genus. Stamens rather longer than the corolla-lobes. Drupes succulent, 3 to 4 lines diameter, enclosing 4 distinct 1-seeded pyrenes.—*Premna Tracyana* or *Vitex Tracyana*, *F. Muell. Fragm.* v. 61.

**Queensland.** Rockingham Bay, *Dallachy*. Although the flowers are small, their structure and that of the fruit appears to me to be entirely those of *Clerodendron*, and not at all those of *Premna* or *Vitex*.

**4. C. tomentosum**, *R. Br. Prod.* 510. A tall shrub or small tree, the foliage and inflorescence usually velvety-pubescent, the older leaves rarely quite glabrous. Leaves on rather long petioles, ovate elliptical or almost lanceolate, shortly acuminate, acute or rarely rounded at the base, 2 to 4 in. long. Flowers in the normal state numerous, in compact terminal corymbs, with rarely a few peduncles bearing small cymes in the upper axils. Calyx campanulate, softly pubescent, about 3 lines long when in flower, divided to about the middle into acute or rather obtuse lobes. Corolla-tube under 1 in. long, the lobes 3 to 4 lines. Stamens protruding by from  $\frac{1}{2}$  to 1 in. Fruiting calyx expanding to  $\frac{3}{4}$  in. diameter, the drupe black and shining.—*Andr. Bot. Rep.* t. 607; *Bot. Mag.* t. 1518; *Schau. in DC. Prod.* xi. 662.

**Queensland.** Brisbane river, *F. Mueller*.

**N. S. Wales.** Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, n. 267, *Macarthur*, (Sydney woods, Paris Exhibition, 1855, n. 104), and many others; northward to Hastings, Macleay, and Clarence rivers, *Beckler* and others; southward to Kiama, *Harvey*.

Var.? *mollissima*, very softly villous, referrible perhaps to *C. lanceolatum*, but with the broader leaves and terminal inflorescence of *C. tomentosum*.

**N. Australia.** Roebuck Bay, N.W. Coast, *Martia*; near Caledon Bay, Gulf of Carpentaria, *R. Gull*.

Ventenat's plate of *Volkameria tomentosa*, Jard. Malm., t. 84, represents an abnormal garden state, flowering very sparingly in the upper axils, connecting this species as well with the following *C. lanceolatum* as with some pubescent small-flowered forms of *C. floribundum*.

5. ***C. lanceolatum***, *F. Muell. Fragm.* iii. 145. A tall shrub or small tree, the foliage and inflorescence softly velvety-pubescent or glabrous. Leaves on rather long petioles, lanceolate or ovate-lanceolate, acute or rather obtuse, 2 to 3 in. long. Cymes in the upper axils several-flowered, shorter than the leaves, on short peduncles. Bracts narrow, acute, or the outer ones more leafy. Calyx broadly campanulate, about  $2\frac{1}{2}$  lines long when in flower, divided to near the middle into obtuse lobes. Corolla usually pubescent outside, the tube about  $\frac{3}{4}$  in. long, or rather more, the lobes scarcely 3 lines. Stamens rather long. Fruiting calyx enlarged, coloured, very open, 4 to 5 lines diameter in the specimens seen, the lobes recurved. Drupe depressed-globular.

**N. Australia.** N. W. coast, Nickol Bay, *Gregory*, *Walcott*; Depuech Island, *Bynoe*.

The leaves are narrower in most of the glabrous specimens than in the pubescent ones, but some of Bynoe's pubescent ones have them also very narrow. The species is not very definitely separated from *C. tomentosum*.

6. ***C. floribundum***, *R. Br. Prod.* 511. A tall shrub or small tree, usually quite glabrous or the young parts tomentose. Leaves on rather long petioles, usually ovate or elliptical, but varying from broadly ovate and cordate to lanceolate, obtuse acute or acuminate; acute rounded or cordate at the base, usually 2 to 3 in. long but sometimes twice as large. Cymes sometimes all loose and few-flowered in the upper axils, sometimes forming a broad terminal corymbose panicle. Flowers to the naked eye apparently glabrous, but often sprinkled with a minute pubescence visible under a lens. Calyx  $2\frac{1}{2}$  to 3 lines long, more acute at the base than in *C. tomentosum*, the lobes acute, about as long as the tube or rather shorter. Corolla-tube usually rather above 1 in. long, but not exceeding  $1\frac{1}{4}$  in., in other specimens rather longer, the lobes short in proportion. Stamens exserted by about 1 in. Fruiting-calyx expanding to above  $\frac{1}{2}$  in. diameter, with a narrow base of 1 to 2 lines.—*Schau.* in *DC. Prod.* xi. 671.

**N. Australia.** N. Coast, *R. Brown*; N. W. Coast, *Bynoe*; Upper Victoria river, *F. Mueller*; islands of the gulf of Carpentaria, *Henne*.

**Queensland.** Endeavour river, *Banks* and *Solander*, Harvey's islands, Keppel Bay and Northumberland islands, *R. Brown*; Percy island and Port Curtis, *M'Gillivray*, Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; Rockhampton, *Dallachy* and others; in the interior, *Mitchell*.

**South Australia.** Daly waters, *Waterhouse*.

The species is exceedingly variable. In general it is to be distinguished from *C. tomentosum* by the absence of pubescence, more acute calyxes, longer flowers and

looser inflorescence. Sometimes the inflorescence approaches that of *C. inermis*, more frequently it is at least on the main branches almost as abundant as in *C. Cunninghamii*. An apparently common abnormal state, produced evidently by the puncture of insects, has axillary cymes with few flowers, in most of which the corolla assumes a campanulate ovoid or globular form of considerable thickness and much regularity.

*C. attenuatum* and *C. medium*, R. Br. Prod. 510, 511, Schau. in DC. Prod. xi. 671, are very slight modifications, which I am quite unable to distinguish from the common forms.

*C. ovatum*, R. Br. Prod. 511, Schau. in DC. Prod. xi. 671, or *C. cardiophyllum*, F. Muell. Fragm. iii. 144, is a form with large, very broad, somewhat coriaceous leaves and loose inflorescence, which may at first sight appear very distinct, but there are quite as many specimens which might equally well be referred to this or to some of the commoner varieties.

*C. coriaceum*, R. Br. Prod. 511, Schau. in DC. Prod. xi. 671, of which the specimens are very indifferent, is much the same as *C. ovatum*, but with pubescent leaves, which connect it with *C. tomentosum*. I have not seen the flowers, and without the corolla there appears to be no positive character to distinguish *C. floribundum* from the two preceding and the following species. *C. ovatum* and *C. tomentosum* R. Br. are both much like the garden specimens figured by Ventenat as *Volkameria tomentosa*.

7. **C. Cunninghamii**, Benth. A tall shrub, either quite glabrous or the under side of the leaves and inflorescence more or less tomentose. Leaves ovate, scarcely acuminate, often narrowed at the base, sometimes above 6 in. long and membranous, sometimes much smaller and firmer, the petiole varying from under 1 in. to above 2 in. Flowers numerous in a broad terminal corymb sometimes dense sometimes loose, with the calyx and structure nearly of *C. floribundum*, but remarkable for the long slender corolla-tube, usually exceeding 2 in., the lobes broad, not above 3 lines long. Stamens rather long. Fruiting calyx more or less funnel-shaped, shortly contracted at the base, the margins very spreading or recurved. Drupe 4 or 5 lines diameter, ripening 2 to 4 distinct pyrenes.

**N. Australia.** S. Goulburn Island, *A. Cunningham*; Escape Cliffs, *Hulls*.

**Queensland.** Cape York, *Daemel, Jardine*; Endeavour river, *A. Cunningham*.

Some of Brown's specimens, as well as others seen only in fruit and referred to *C. floribundum*, may perhaps belong to *C. Cunninghamii*. Some of *F. Mueller's* from Gilbert river, with more pubescent leaves, are very doubtful.

8? **C. costatum**, R. Br. Prod. 511. A tall shrub. Leaves very broadly ovate, obtuse, 4 to 5 lines long, reticulate-rugose and velvety-tomentose underneath. Inflorescence a terminal corymbose panicle, not exceeding the leaves but looser than in *C. tomentosum*. Flowers not seen. Fruiting calyx enlarged and drupe of *C. floribundum*.—Schau. in DC. Prod. xi. 671.

**Queensland.** Endeavour river, *Banks and Solander*.

The foliage is that of *Gmelina Leichhardtii*, but the fruit undoubtedly that of *Clerodendron*, and not of *Gmelina*.

## 17. **GMELINA**, Linn.

Calyx 4- or 5-toothed or sinuate-lobed. Corolla-tube much dilated upwards or almost campanulate; limb oblique, with 4 or 5 spreading lobes, the two upper ones sometimes united in an upper lip. Stamens 4, in pairs, shorter than the corolla. Ovary 4-celled with 1 ovule in each







cell laterally attached at or above the middle; style filiform, unequally 2-lobed at the top. Fruit a succulent drupe, the putamen hard or bony, 4-celled or rarely 2-celled. Seeds solitary in each cell, without albumen. Trees or tall shrubs. Leaves opposite, undivided. Flowers often rather large, pale purplish pink or blue, or in species not Australian, yellow, in cymes arranged in irregular terminal panicles, sometimes almost reduced to simple racemes. Bracts small.

The genus extends over tropical Asia and the Indian Archipelago. The Australian species, although with the aspect of some Asiatic ones, appear to be all endemic.

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|--|-------------------------------|
| Leaves glabrous (above 6 in.). Panicle long and narrow. Cymes pedunculate . . . . .  | 1. <i>G. macrophylla</i> .    |
| Leaves glabrous (under 6 in.). Cymes forming sessile clusters along the rachis of the panicle or of its branches . . . . . | 2. <i>G. fasciculiflora</i> . |
| Leaves tomentose underneath. Cymes pedunculate in a loosely pyramidal panicle . . . . .                                    | 3. <i>G. Leichhardtii</i> .   |

1. ***G. macrophylla*, Benth.** A tall tree, glabrous except the inflorescence, which is slightly tomentose. Leaves ovate or ovate-oblong, obtuse, broad and sometimes almost cordate at the base, 8 to 10 in. long, coriaceous and glabrous but not shining, on petioles of 1 to 1½ in. Flowers "pale blue," in a long terminal thyrsoid panicle, the cymes on opposite peduncles, the pedicels very short. Calyx campanulate, about 2 lines long, truncate or sinuate-lobed, scarcely enlarged or sometimes slightly expanded under the fruit. Corolla villous outside with appressed hairs, the tube declinate and much dilated upwards, about ½ in. long, lobes 5, broad, about ¼ in. long, the middle lower one rather larger than the others. Stamens ascending under the upper lobes, anther-cells diverging. Ovary glabrous, 4-celled. Upper lobe of the style minute. Drupe obovoid-truncate, ½ to ¾ in. long, closely resembling that of *G. arborea*.—*Vitex macrophylla*, R. Br. Prod. 512, Schau. in DC. Prod. xi. 695; *Vitex Dalrympleana*, F. Muell. Fragm. iv. 128; v. 72; *Ephielis simplicifolia*, Seem. Fl. Vit. 189.

**N. Australia.** Port Essington, *Armstrong*.

**Queensland.** Cape Grafton, *Banks and Solander*; Cape York, *Daemel*; Rockingham Bay, *Dallachy*.

2. ***G. fasciculiflora*, Benth.** A tall tree, nearly glabrous except the inflorescence which is densely ferruginous-tomentose. Leaves ovate, obtuse or obtusely acuminate; usually broad, 3 to 5 in. long, somewhat coriaceous, shining above, the primary veins much raised underneath but not nearly so reticulate as in *G. Leichhardtii*. Cymes reduced to dense opposite clusters sessile along the branches of a terminal panicle, the floral leaves at the base of the clusters reduced to broad bracts shorter than the calyxes. Pedicels very short. Calyx broadly campanulate, ferruginous-villous, about 2 lines long, truncate or more or less distinctly toothed. Corolla "pale purple," villous, the tube short but much more dilated and oblique than in *G. Leichhardtii*, the lower lip fully ½ in. long, with a large broad middle lobe, the upper lobes all broad but much shorter than the lowest. Fruit not seen.—*Vitex Leichhardtii*, var. *glabrata*, F. Muell.

**Queensland.** Rockingham Bay, *Dallachy*.  
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**3. G. Leichhardtii**, *F. Muell.* A fine timber tree, attaining a great height, the young branches and inflorescence tomentose. Leaves ovate, scarcely acuminate but rather acute, rounded or cuneate at the base, 3 to 6 in. long, somewhat coriaceous, quite glabrous and almost rugose on the upper side, much reticulate with raised veins and densely and softly tomentose underneath, the petiole often above 1 in. long. Flowers "white with purple markings," numerous in opposite pedunculate cymes forming loose ovoid or shortly pyramidal terminal panicles. Calyx broadly turbinate-campanulate, truncate, tomentose and not 2 lines long at the time of flowering, enlarged and spreading under the fruit. Corolla villous outside, the tube very broad and dilated upwards, twice as long as the calyx, the lobes ovate, above 2 lines long, the 2 upper ones rather larger and shortly united in an upper lip. Stamens incurved, the longer pair about as long as the upper lip; anther-cells diverging. Fruits in the specimens seen all deformed by insects, the calyx opening out horizontally to a diameter of 6 to 8 lines and obscurely sinuate-toothed.—*Vitex Leichhardtii*, *F. Muell. Fragm.* iii. 58.

**Queensland.** Myall Creek, *Leichhardt*; Moreton Bay, *W. Hill*, *Queensland woods*, *London Exhibition*, 1862, n. 30; Pine river, *Fitzalan*.

**N. S. Wales.** Clarence river, *Beckler*, *W. Moore*, *N. S. Wales woods*, *London Exhibition*, 1862, n. 68 and 171, "White Beach," also *Macarthur*, *Paris Exhibition*, 1855, n. 193.

## 18. VITEX, Linn.

Calyx 5-toothed or lobed. Corolla-tube short; limb spreading, 5-lobed, the lowest lobe larger and longer than the others and sometimes notched. Stamens 4, in pairs, ascending and exerted beyond the upper corolla-lobes. Ovary 2-celled or more or less perfectly 4-celled, with 1 ovule to each half-cell or cell, laterally attached at or above the middle. Style filiform, shortly and acutely 2-lobed. Fruit a succulent drupe, the putamen separating into 4 hard one-seeded pyrenes (or fewer by abortion). Seeds without albumen.—Trees or shrubs. Leaves opposite, usually of 3 or 5 digitate leaflets, very rarely single (or of a single leaflet). Flowers in cymes, sometimes axillary but usually in terminal panicles either simple and spike-like or branched. Bracts very small.

A considerable tropical and subtropical genus, chiefly Asiatic or African with a few American species, and one species extending to S. Europe. Of the four Australian species, one is widely spread over the Old World within the tropics, the three others are endemic.

- |  |                            |
|--|----------------------------|
| Leaves white underneath, undivided or of 3 or 5 leaflets . . . . . | 1. <i>V. trifolia</i> .    |
| Leaves green on both sides, undivided . . . . .                    | 2. <i>V. lignum vitæ</i> . |
| Leaves green on both sides, of 3 or 5 leaflets.                    |                            |
| Flowers in loose thyrsoid panicles, mostly terminal . . . . .      | 3. <i>V. acuminata</i> .   |
| Flowers in very loose dichotomous cymes on axillary peduncles      | 4. <i>V. glabrata</i> .    |

**1. V. trifolia**, *Linn*; *Schau. in DC. Prod.* xi. 683. A shrub sometimes decumbent and low, in some varieties tall and erect, the branches, under side of the leaves and inflorescence mealy-white. Leaves very variable, simple or of 3 or 5 leaflets often white on both sides, but









usually becoming nearly glabrous on the upper side at least when old. Flowers nearly white or pale blue, in small nearly sessile opposite cymes, forming short terminal panicles, either simple and spike-like or slightly branched, the floral leaves reduced to short bracts. Calyx in the typical forms about 2 lines long, very shortly 5-toothed, the corolla-tube nearly twice as long as the calyx, the 4 upper lobes short, the lowest twice as large and often as long as the tube and both calyx and corolla more or less mealy outside. Ovary 2-celled, with 2 ovules in each cell. Drupe globular.

**N. Australia.** Victoria river, *F. Mueller*; islands of the Gulf of Carpentaria, *Henne*, and mainland, *F. Mueller*, *Landsborough*.

**Queensland.** Along the coast from Cape York to Moreton Bay, *R. Brown*, *A. Cunningham*, *F. Mueller*, *Dallachy*, and many others.

The species is a very common Asiatic one, chiefly maritime, and varying very much as to foliage, the three following principal Australian forms agreeing more or less with Asiatic varieties, but some of them passing into species which in Asia are considered as perfectly distinct.

*α obovata*. Decumbent. Leaflets (or simple leaves) mostly solitary, obovate or rounded, 1 to 1½ in. long, rarely especially on flowerless branches 3-foliate and less obtuse. A strictly maritime variety in N. Australia and Queensland as in tropical Asia.—*V. ovata*, Thunb., Hook. and Arn. Bot. Beech. 206, t. 47, R. Br. Prod. 511.

*β acutifolia*. Decumbent or erect. Leaflets 3 or sometimes 5 or only 1, ovate or ovate-lanceolate, acute or acuminate, the middle one often above 2 in. long.—*V. trifolia*, R. Br. Prod. 511.—Common along the coast of Queensland and appears to be not so strictly maritime as the obovate-leaved form.

*γ parviflora*. Erect. Leaflets 5 or sometimes 3, ovate or ovate-lanceolate, acute. Flowers much smaller than in the two preceding forms, and resembling those of the Asiatic *V. Negundo*, from which this variety is scarcely to be distinguished.—In N. Australia on the Gulf of Carpentaria, and Moreton Bay in Queensland.

There are numerous intermediate specimens connecting the above three principal forms.

2. **V. lignum-vitæ**, *A. Cunn.*, *Schau. in DC. Prod.* xi. 692. A tall handsome tree, the young branches petioles and inflorescence rusty-tomentose or pubescent. Leaves all simple (or unifoliate?), oblong or oval-elliptical, shortly acuminate, narrowed at the base, 1½ to 4 in. long on a petiole of ¼ to ½ in., somewhat coriaceous, shining on the upper side, paler underneath, conspicuously veined, quite glabrous or with a slight pubescence on the midrib underneath, those of barren branches sometimes broadly and unequally lobed, those of flowering branches usually entire but occasionally showing a few prominent angles or short lobes. Flowers few, in small loose axillary cymes. Calyx truncate, about 1 line long or rather more, rarely tomentose. Corolla tomentose outside, the tube 3 to 4 lines long, broad and incurved, the middle lower lobe not exceeding the others so much as in some species. Stamens shortly exerted beyond the upper lobes.—*F. Muell. Fragm.* iii. 58.

**Queensland.** Brisbane river, Moreton Bay, *A. Cunningham*, *W. Hill*, *F. Mueller*, *C. Moore*, *Queensland woods*, *London Exhibition*, 1862, n. 29.

**N. S. Wales?** "Sydney woods," *Paris Exhibition*, 1855, n. 3.

3. **V. acuminata**, *R. Br. Prod.* 512. A small or large tree, the young shoots and inflorescence more or less hoary-pubescent, the adult leaves

glabrous or nearly so. Leaflets 3 or rarely 5, ovate-oblong, elliptical or almost lanceolate, mostly acuminate, contracted at the base into a petiolule sometimes very short, sometimes  $\frac{1}{4}$  in. long, the terminal leaflets often 3 to 4 in. long or even more, the lateral ones usually shorter, all membranous, green on both sides, paler and usually glandular-dotted underneath, the common peduncle usually shorter than the leaflets. Flowers small, in loose thyrsoid panicles of 2 to 4 in., terminal or in the upper axils. Pedicels very short. Calyx 1 to  $1\frac{1}{4}$  in. long, truncate or minutely toothed. Corolla pubescent outside, villous inside in the throat and the base of the limb, the tube about twice as long as the calyx, the lower lip nearly as long as the tube. Stamens shortly exserted beyond the upper lobes. Ovary 2-celled, with 2 ovules in each cell. Drupe in Dallachy's specimen nearly globular, about  $\frac{1}{2}$  in. diameter, the putamen bony and 4-celled as in *Gmelina*, bearing outside a number of radiating riblike excrescences, and perhaps therefore diseased, in R. Brown's smaller and apparently more perfect. Seed not seen perfect.—Schau. in DC. Prod. xi. 695; F. Muell. Fragm. v. 34; *V. meliopea*, F. Muell. Fragm. v. 35.

**N. Australia.** Vansittart and Careening Bays, N. W. Coast, *A. Cunningham*; Arnheim Bay and Islands of the Gulf of Carpentaria, *R. Brown*.

**Queensland.** Cape York, *M'Gillivray*, *W. Hill*, *Daemel*; Wide Bay, *Bidwill*; Rockingham Bay, *Dallachy*; Rockhampton, *Dallachy* and others.

*V. Timoriensis*, Walp.; Schau. in DC. Prod. xi. 686, from Timor, may be the same as *V. acuminata*.

4. ***V. glabrata***, *R. Br. Prod.* 512. A tree or shrub, quite glabrous or rarely with a minute tomentum on the young shoots and inflorescence. Leaflets 3 or rarely 5, from broadly ovate and obtuse to elliptical-oblong and acuminate, 2 to 4 in. long, but usually much broader than in *V. acuminata* and less narrowed at the base, the petiolules about  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, and the common petiole above 2 in. Flowers white, rather small, in very loose dichotomous cymes on axillary peduncles sometimes nearly as long as the petiole, but the whole inflorescence almost always shorter than the leaf. Pedicels shorter or rarely longer than the calyx. Calyx about  $1\frac{1}{4}$  lines long, truncate or minutely toothed. Corolla-tube at least twice as long as the calyx, and the lower lip nearly as long as the tube. Stamens shortly exserted beyond the upper lobes. Fruit, in the specimens seen, 1-seeded by abortion, obovoid, about  $\frac{1}{2}$  in. long.—Schau. in DC. Prod. xi. 695; *V. Cunninghamii*, Schau. l. c. 691.

**N. Australia.** Careening Bay, N. W. Coast, *A. Cunningham*; Victoria and Fitzmaurice rivers and Macadam range, *F. Mueller*; Groote island, Gulf of Carpentaria, *R. Brown*; Port Essington, *Armstrong*; Adams Bay, *Hulls*.

**Queensland.** Cape York, *Daemel*; Gilbert river, *Daintree*.

The cultivated specimen described by F. Muell. Fragm. v. 35 as *V. glabrata*, is the New Zealand *V. littoralis*, *A. Cunn.*, remarkable for its large differently shaped corolla. C. Moore's George-river specimen may be the same, but if so, it is probably cultivated also.

SUBTRIBE 3. OXEREÆ.—Ovary distinctly 2- or 4-lobed.











## 19. FARADAYA, F. Muell.

Calyx closed before flowering, then dividing into 2 valvate segments. Corolla-tube dilated upwards, limb 4-lobed, the upper lobe broad and emarginate, the three lower nearly equal. Stamens 4, didynamous, exserted. Ovary shortly 4-lobed, 4-celled in the upper portion, with one ovule in each cell laterally attached. Fruit a drupe, the putamen 1-celled and 1-seeded by abortion (or 4-lobed with 4 distinct pyrenes?).—Woody climbers. Leaves opposite, undivided. Flowers rather large, in terminal panicles.

Besides the Australian species, there are three from the S. Pacific islands. The nearest affinity of the genus appears to be with the New Caledonian *Oxera*.

1. **F. splendida**, F. Muell. *Fragm.* v. 21, 212. A tall woody climber, quite glabrous. Leaves ovate, acuminate, rounded or cordate at the base, 6 in. to nearly 1 ft. long, prominently penniveined, the petiole 1 to 2 in. long. Flowers large, white, in a terminal corymbose panicle. Bracts small, subulate. Pedicels  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long. Calyx before expanding obovoid and acuminate, dividing into 2 acuminate segments 8 to 10 lines long. Corolla-tube above 1 in. long, the lobes flat, nearly  $\frac{3}{4}$  in. long. Filaments sprinkled with hairs below the middle, inserted in the throat of the corolla; anthers with 2 parallel cells. Ovary tomentose. Drupe only one seen which was 1-seeded, about 2 in. long, contracted at the base and apparently proceeding from one lobe of the ovary, the other lobes remaining abortive at the base, as there is no scar of the style at the upper end. Seed not seen.

**Queensland.** Rockingham Bay, *Dallachy*.

TRIBE 3. AVICENNIEÆ.—Fruit a 2-valved capsule. Seed solitary, without integuments; embryo with large folded cotyledons.

## 20. AVICENNIA, Linn.

Calyx divided to the base into 5 distinct segments or sepals. Corolla-tube short and broad; limb of 4 nearly equal spreading lobes or the upper one rather larger. Stamens 4, inserted in the throat, with the anthers slightly protruding. Ovary 1-celled, with 4 ovules collaterally suspended from a central column, which has 4 angles between the ovules, imperfectly dividing the ovary into 4 cells. Fruit a compressed capsule, the pericarp opening in 2 valves. Seed solitary, erect, without integuments, (the integuments of the ovule not developed); embryo with 2 very large cotyledons folded longitudinally, a very hairy radicle, and a prominent plumula, which germinates before the fruit drops off as in *Rhizophora*, &c.—Shrubs. Leaves opposite, undivided. Flowers in small cymes in the upper axils or in terminal panicles.

The genus consists of very few species, widely distributed over the warmer maritime regions of the New and the Old World, and very nearly related to each other. The Australian species is the typical and most common form.

1. **A. officinalis**, Linn.; Schau. in DC. *Prod.* xi. 700. An erect shrub, varying much in height, the branches inflorescence and under-

side of the leaves white or silvery with a very close tomentum, more silky on the flowers, the upper side of the leaves usually glabrous when full grown, black and shining when dry. Leaves coriaceous, usually lanceolate or ovate-lanceolate, 2 to 3 in. long, acute and contracted into a petiole, but varying to elliptical or obovate, and very obtuse. Cymes contracted into small heads on rigid angular peduncles, which are often 2 together in the upper axils or several in a small terminal leafy thyrus. Bracts shorter than the sepals. Sepals orbicular or broadly ovate, concave, hirsute and ciliate, about  $1\frac{1}{2}$  line long. Corollatube shorter than the sepals, lobes ovate, rather longer than the tube, the upper inner one rather larger than the others. Ovary very hairy.—*A. tomentosa*, Jacq.; R. Br. Prod. 518; Schau. in DC. Prod. xi. 699; Wall. Pl. As. Rar. t. 271; Wight, Ic. t. 1481.

**N. Australia, Queensland, N. S. Wales, Victoria, S. Australia, and W. Australia**, extending along the sea-coast all round the Australian continent, *R. Brown* and many others, but no specimens seen from Tasmania. It is a common sea-coast shrub in tropical Asia, Africa, and America.

### ORDER XCIII. LABIATÆ.

Flowers irregular or rarely nearly regular. Calyx persistent, 5-toothed or 2-lipped. Corolla with a distinct tube and 4 or 5 lobes more or less 2-lipped or nearly equal, imbricate in the bud, the upper lip or lobes usually and perhaps always outside. Stamens 2 or 4, in pairs, inserted in the tube of the corolla and alternating with its lower lobes. Anthers either 2-celled, or 1-celled by the confluence of the 2 cells or by the abortion of one of them. Ovary 4-lobed, with one erect ovule in each lobe. Style single, arising from the centre of the ovary, terminating in 2 short stigmatic lobes. Fruit enclosed in the calyx, consisting of 4 small seed-like nuts. Seeds solitary in each nut, without albumen. Embryo straight or slightly incurved (except in *Scutellaria*); radicle short, inferior, cotyledons thick.—Herbs or shrubs, very rarely arborescent, the stem and branches usually 4-angled. Leaves always opposite or whorled, without stipules, toothed or more rarely entire or divided. Flowers in opposite cymes or rarely solitary, forming frequently (by the extreme shortness or abortion of the common peduncle and branches of each cyme, the pedicels alone being developed) clusters called *false-whorls* or *verticillasters*, consisting of 3, 5, or more pedicels on each side of the stem; these false-whorls either in the axils of the stem-leaves or more frequently forming terminal racemes or panicles, the floral leaves subtending the clusters being reduced to small bracts. Real bracts, subtending the pedicels, usually abortive or reduced to bristles, rarely more prominent and leaflike. Foliage and green parts often studded with glandular dots filled with resinous oil rendering the plants highly aromatic. Nuts when soaked in water frequently emitting a thick mucilaginous coating.

A large Order generally distributed over every part of the globe. Of the twenty Australian genera (excluding *Hyptis*) four are extratropical genera of the northern

hemisphere, very sparingly extending into or represented in the Southern hemisphere or in mountainous regions of the tropics, three are also extratropical and chiefly northern, but also more or less numerous within the tropics, especially in mountain ranges, two are tropical, chiefly Asiatic but also represented in America, six are confined to the tropical regions of the Old World and chiefly or entirely Asiatic, the remaining five, constituting the distinct tribe *Prostantherææ*, are endemic in Australia and chiefly extratropical.

TRIBE 1. **Ocimoidesæ**.—*Stamens 4, declinate. Anthers 1-celled by the confluence of the 2 cells into one. Nuts dry, smooth or minutely granular.*

Corolla lower lobe flat or nearly so, not longer than the upper lobes.

Corolla-tube shorter than or scarcely exceeding the calyx.

Style with 2 short stigmatic lobes.

Fruiting calyx deflexed with a broad decurrent upper lobe.

False-whorls equal, 6-flowered . . . . .

1. OCIMUM.

Fruiting calyx erect spreading or deflexed, the upper lobe scarcely decurrent. Flowers very small in one-sided racemes . . . . .

2. MOSCHOSMA.

Corolla-tube exerted. Style capitate or clavate at the end.

Calyx of *Ocimum* . . . . .

3. ORTHOSIPHON.

Corolla lower lobe concave or boat-shaped, longer than the upper lobes (except in *Plectranthus longicornis*).

Filaments free. Corolla sometimes spurred . . . . .

4. PLECTRANTHUS.

Filaments united at the base in a sheath round the style.

Corolla never spurred . . . . .

5. COLEUS.

Corolla lower-lobe saccate, contracted at the base and abruptly deflexed . . . . .

6. HYPTIS.

TRIBE 2. **Satureiææ**.—*Stamens 4 or 2, erect and equal or ascending in pairs, the upper pair the shortest. Anthers 2-celled or 1-celled by the confluence of the 2 cells into one. Nuts dry, smooth or minutely granular. Corolla-lobes all equally spreading, or if 2-lipped the upper lip scarcely concave and not hoodshaped.*

Corolla-lobes nearly equal.

Anthers terminal 1-celled. Filaments bearded . . . . .

7. DYSOPHYLLA.

Anthers 2-celled. Filaments glabrous.

Perfect stamens 4 . . . . .

8. MENTHA.

Perfect stamens 2 . . . . .

9. LYCOPUS.

Corolla-lobes forming 2 lips.

Stamens 4, erect, diverging. Flowers in heads or short spikes with imbricate bract-like floral leaves . . . . .

\* ORIGANUM.

Stamens 4, ascending in pairs. Calyx 2-lipped. Corolla-tube curved upwards above the base . . . . .

\* MELISSA.

TRIBE 3. **Monardesææ**.—*Stamens 2; anthers with one oblong or linear perfect cell, the other either quite abortive or deformed or sterile or separated from the upper one by a filiform connective. Nuts dry, smooth or minutely granular. Calyx and corolla usually 2-lipped.*

Connective of the anthers filament-like, transversely fixed on the short real filament . . . . .

10. SALVIA.

Connective of the anthers short, continuous with the end of the filament, the junction marked by a minute tooth . . . . .

\* ROSMARINUS.

TRIBE \* **Nepetææ**.—*Stamens 4, in pairs, the upper ones the longest. Anthers 2-celled. Nuts dry, smooth or granular-tuberculate. Calyx 15-nerved. Corolla upper lip concave or hoodshaped.*

Calyx straight or incurved, scarcely 2-lipped . . . . .

\* NEPETA.

TRIBE 4. **Stachydææ**.—*Stamens 4, ascending in pairs, the lower ones the longest.*

*Anthers, at least the upper ones, 2-celled. Nuts dry, smooth or granular-tuberculate. Calyx usually 5- or 10-nerved. Corolla upper lip concave or hood-shaped.*

Calyx 2-lipped, the lips closed after flowering.

Calyx upper lip flat, 3-toothed, lower 2-lobed. False-whorls 6-flowered, in dense terminal spikes. . . . . 11. PRUNELLA.

Calyx-lips entire, the upper one with a hollow scale-like protuberance on the back. Flowers opposite in pairs . . . . . 12. SCUTELLARIA.

Calyx 5- or 10-toothed, not 2-lipped.

Stamens included in the corolla-tube Upper corolla-lip narrow.

Calyx often 10-toothed . . . . . \* MARRUBIUM.

Stamens protruding from the short upper lip . . . . . 13. ANISOMELES.

Stamens ascending under the upper lip.

Calyx 5-toothed, not much enlarged after flowering. . . . . \* STACHYS.

Calyx 5-toothed, very large open and membranous, at least after flowering . . . . . \* MOLUCCELLA.

Calyx 8- or 10-toothed.

Corolla upper lip short very hairy . . . . . 14. LEUCAS.

Corolla upper lip very long. (Flowers large, scarlet) . . . \* LEONOTIS.

TRIBE 5. **Prostanthereæ**.—*Stamens 4, in pairs; anthers all with two perfect cells, or one cell of all the anthers or also both cells of the lower pair sterile or abortive. Nuts prominently reticulate-rugose. Seeds albuminous. Calyx various. Corolla upper lip erect, usually short, throat broad.*

Calyx 2-lipped, the lips entire or nearly so. Anthers with 2 perfect cells, the connective not elongated . . . . . 15. PROSTANTHERA.

Calyx 2-lipped or 5-toothed. Anthers with an elongated connective bearing at the upper end one perfect cell.

Connective with the lower end reduced to a small tooth. Leaves pungent-pointed . . . . . 16. HEMIANDRA.

Connective with the lower end dilated linear or clavate or bearing an imperfect cell, usually bearded in the upper anthers. Leaves obtuse or rarely acute, not pungent . . . 17. HEMIGENIA.

Calyx nearly equally 5-toothed. Lower anthers sterile and reduced to 2 linear or clavate lobes.

Connective of the upper anthers elongated, the lower end dilated and bearded. Corolla upper lip very concave or hood-shaped . . . . . 18. MICROCORYS.

Upper anthers of one cell almost sessile on the filament. Corolla upper lip flat, 2-lobed . . . . . 19. WESTRINGIA.

TRIBE 6. **Ajugoideæ**.—*Stamens 4, in pairs exserted from the very short truncate or deeply slit upper lip of the corolla (except very rarely in genera not Australian). Nuts prominently reticulate-rugose, not succulent. Seeds without albumen.*

Corolla with the four upper lobes lateral, equal or the upper ones longer, the stamens exserted from between the 2 upper ones . . 20. TEUCRIUM.

Corolla with the upper lip exceedingly short and truncate, the stamens exserted beyond it, the lateral lobes oblong, forming part of the lower lip . . . . . 21. AJUGA.

The introduced plants belonging to the genera marked above with the asterisk \* are the following:—

*Origanum vulgare*, Linn., Benth. in DC. Prod. xii. 193. A perennial with a shortly creeping rootstock and erect stems of 1 to 2 ft. Leaves petiolate, ovate or ovate-lanceolate, slightly toothed. Flowers purple or rarely white, in globular compact heads, forming a terminal trichotomous rather compact panicle. Bracts or bract-like floral leaves imbricate, as long as the calyx. Calyx very hairy inside, with short nearly equal teeth. Corolla-lobes nearly equal in length, the upper one broad and nearly erect. Stamens 4, erect, diverging, the two lower longer ones always, and often all 4 exserted.—Very common in the temperate regions of the northern hemisphere, and now introduced at Plenty Creek, Victoria, *F. Mueller*.



*Melissa officinalis*, Linn.; Benth. in DC. Prod. xii. 240. A rather coarse erect branching perennial of 1 to 3 feet, usually hairy. Leaves broadly ovate, crenate. Flowers few together in loose axillary false-whorls, all turned to one side. Calyx 2-lipped, the upper lip rather flat, 3-toothed, the lower 2-lobed. Corolla whitish, twice as long as the calyx, the tube curved upwards above the base, the upper lip erect, emarginate, the lower spreading, 3-lobed. Stamens 4, in pairs, ascending under the upper lip, the lower ones the longest.—A native of southern Europe and western Asia, long since cultivated (in England under the name of *Balm*) and readily naturalizing itself in the vicinity of gardens, in which localities it is also established in Victoria, *F. Mueller*.

*Rosmarinus officinalis*, Linn.; Benth. in DC. Prod. xii. 360. An erect shrub of 2 to 4 ft. Leaves sessile, linear, entire, with revolute margins. Flowers white or pale blue, opposite in pairs, in very short axillary racemes. Calyx 2-lipped, the upper lip entire, the lower 2-lobed. Corolla upper lip erect, emarginate, lower lip 3-lobed, the lateral lobes oblong and erect, the lowest large, broad, and spreading. Stamens 2, ascending, the filaments with a small tooth below the middle (indicating the junction of the real filament with the filament-like connective). Anthers 1-celled.—This the well-known *Rosemary*, a native of southern Europe, and of early cultivation among sweet herbs, has been introduced into Hope Valley, Victoria, *F. Mueller*.

*Nepeta Cataria*, Linn.; Benth. in DC. Prod. xii. 383. An erect herbaceous hoary-pubescent branching perennial, attaining 2 or 3 feet. Leaves petiolate, ovate-cordate, acute, coarsely toothed, often whitish underneath. Flowers pale blue or nearly white, numerous in compact false-whorls, forming short oblong terminal spikes, with frequently one or more false-whorls lower down. Calyx 15-ribbed, the orifice oblique, 5-toothed. Corolla upper lip erect, concave, lower lip longer, spreading, 3-lobed. Stamens 4, ascending in pairs under the upper lip, the upper or inner pair the longest. Anthers 2-celled.—Common on roadsides, in hedges, &c. in many parts of Europe and Asia, and readily naturalized in other temperate regions; occurs in the neighbourhood of Adelaide.

*Marrubium vulgare*, Linn.; Benth. in DC. Prod. xii. 453. An erect hard branching perennial, the stems thickly covered with white cottony wool. Leaves petiolate, orbicular, soft, whitish, and much wrinkled. Flowers small, of a dirty white, in dense axillary false-whorls. Calyx with 10 small hooked teeth. Corolla upper lip narrow, erect, 2-cleft, lower lip spreading, 3-lobed. Stamens 4, included in the corolla-tube. Anthers 2-celled.—A roadside weed of European or Asiatic origin, now naturalized in many parts of the world, and gathered by various collectors in N. S. Wales, Victoria, and S. Australia.

*Stachys arvensis*, Linn.; Benth. in DC. Prod. xii. 477. A decumbent or slightly ascending slender hairy annual, from an inch or two to nearly a foot long. Leaves small, petiolate, ovate. Flowers small, of a pale purple, in false-whorls of 2 to 6 or rarely 8, forming loose leafy spikes. Calyx with 5 nearly equal teeth as long as the tube. Corolla scarcely longer than the calyx, the upper lip erect, concave and entire, the lower lip spreading, 3-lobed. Stamens 4, in pairs, ascending under the upper lip. Anthers 2-celled.—A common weed of cultivation in Europe and temperate Asia, carried out with European crops to various parts of the world, and well established even in tropical countries, now abundant in some parts of Queensland, N. S. Wales, and Victoria.—*S. palustris*, Linn.; Benth. in DC. Prod. xii. 470, a tall erect perennial, with nearly sessile, oblong or lanceolate leaves and rather large pale purple flowers in false-whorls of 6 to 8, forming terminal spikes, a common northern plant in ditches, moist banks, &c., has been gathered on Richmond river in N. S. Wales by *Fawcett*.

*Moluccella laevis*, Linn.; Benth. in DC. Prod. xii. 513. A glabrous erect or ascending annual of 1 to 2 ft. Leaves on long petioles, broadly ovate or almost orbicular. Flowers in distant false-whorls of about 6, the floral leaves gradually smaller but all on long petioles, the bracts connate at the base. Calyx very large, campanulate, oblique, and membranous, the margin 5-angled with a small point at each angle, attaining sometimes nearly 2 in. diameter. Corolla shorter than the calyx, whitish, the upper lip erect, concave, entire, the lower spreading, 3-lobed. Stamens 4, ascending in pairs under the upper lip. Anthers 2-celled.—A native of the Mediterranean region, now established in New England, *C. Stuart*, and on the Murrumbidgee, *F. Mueller*.

*Leonotis leonurus*, R. Br.; Benth. in DC. Prod. xii. 536. A shrub attaining several feet. Leaves oblong-lanceolate, contracted into a short petiole. Flowers of a rich scarlet, few or many, in axillary false-whorls. Calyx 10-toothed. Corolla often fully 2 in.

long, hairy, the upper lip long erect and concave, the lower lip short and spreading. Stamens 4, ascending in pairs under the upper lip. Anthers 2-celled.—A native of the Cape of Good Hope, long since cultivated in gardens for its showy flaming flowers, now established with other South African plants in West Australia.

**TRIBE 1. OCIMOIDEÆ.**—Stamens 4, declinate towards the lower lobe of the corolla. Anthers when fully out 1-celled by the confluence of the two cells. Nuts dry, smooth or minutely granular. Calyx with the upper tooth often much broader than the others. Corolla with the four upper lobes flat, the lowest alone forming the lower lip, and flat concave or saccate.

### 1. OCIMUM, Linn.

Fruiting-calyx enlarged and reflexed, the upper tooth orbicular or ovate with the margins decurrent, forming an upper lip, the 4 lower teeth small, pointed, equal or the two lowest with longer points. Corolla-tube straight, rarely exceeding the calyx, 4 upper lobes united in a broad shortly 4-lobed upper lip, the fifth lower lobe entire, flat or slightly concave, about as long as the upper lip. Stamens 4, declinate, the 2 upper ones usually with a tooth or tuft of hairs near the base; anther-cells confluent. Style-lobes subulate or somewhat flattened. Nuts smooth or minutely granular.—Herbs undershrubs or rarely small shrubs. Foliage usually densely dotted and highly scented. Flowers in false-whorls of 6, rarely 10, arranged in terminal racemes, the floral leaves reduced to small deciduous bracts.

The genus extends over the tropical and subtropical regions of the New as well as the Old World, two or three species having been very long in cultivation amongst aromatic herbs. The only Australian species is a slight, almost endemic variety of one of the common Asiatic ones.

1. *O. sanctum*, Linn.; *Benth. in DC. Prod.* xii. 38, var. *angustifolium*. A branching perennial or undershrub, usually forming a thick woody base, but sometimes flowering the first year so as to appear annual, rarely exceeding 1 ft. in height, more or less hirsute with spreading or reflexed hairs. Leaves on rather long petioles, mostly oblong-lanceolate,  $\frac{1}{2}$  to  $1\frac{1}{2}$  in. long, bordered by a few coarse teeth or nearly entire, more rarely ovate. Flowers small, purple, (*F. Mueller*) or pure white (*Bowman*), in loose whorls of 6, forming terminal racemes, the bract-like floral leaves very small. Pedicels slender, often as long as the calyx. Calyx scarcely 1 line long at the time of flowering, when in fruit 2 to  $2\frac{1}{2}$  lines long, the upper lobe orbicular, the lateral ones small and acute, the 2 lowest with long subulate points. Corolla-tube nearly as long as the calyx, the lips as long as the tube, the lower lobe or lip broadly ovate, or nearly orbicular. Stamens shortly exerted, the 2 upper ones with tufts of hairs near the base of the filaments. Style-lobes slightly flattened.—*O. anisodorum* and *O. caryophyllum*, *F. Muell. Fragm.* iv. 46.

**N. Australia.** Victoria river, Hooker's and Sturt's Creeks, *F. Mueller*; Gulf of Carpentaria, *F. Mueller, Landsborough*; N. Kennedy district, *Daintree*; in the interior, lat.  $18^{\circ} 30'$ , *M'Douall Stuart's Expedition*.









**Queensland.** Burdekin and Suttor rivers and Peak Downs, *F. Mueller*; Bowen, Isaacs and Suttor rivers, *Bowman*.

Widely diffused over tropical Asia, extending into Africa, but usually with broader leaves than in Australia. It is frequently cultivated in East Indian gardens, about temples, &c., for its strong aromatic properties.

*F. Mueller* observes that his *O. anisodorum* and *O. caryophyllinum* (which I am quite unable to distinguish from each other) are closely allied to *O. basilicum*; they differ however not only in the small flowers and long pedicels, but more essentially in the tooth of the upper (not the lower) stamens being replaced by the tuft of hairs of *O. sanctum*. From the common Indian form of *O. sanctum* (which by some mistake I stated in the Prodrômus to be inodorous) I can perceive no difference, except in the narrow leaves and usually less hispid stems, but some Australian specimens have ovate leaves, and the hairs of the stem are very variable, whilst a very few Indian ones have narrow leaves. The calyx-lobes are more ciliate in the margin in Australia than in India, but I have not seen the hairs closing the orifice as in the Mascarene *O. gracile*.

## 2. MOSCHOSMA, Reichb.

Fruiting-calyx somewhat enlarged, erect spreading or reflexed, the upper tooth broad, with the margins scarcely decurrent, forming an upper lip, the 4 lower teeth small, acute, nearly equal. Corolla-tube straight, rarely exceeding the calyx, the 4 upper lobes united in a broad 3- or 4-lobed upper lip, the fifth lower lobe entire, flat or slightly concave, about as long as the upper lip. Stamens 4, declinate, the filaments without any appendage; anther-cells confluent. Style shortly clavate at the end, entire or emarginate. Nuts smooth or minutely granular.—Herbs, usually annual and much branched. Flowers minute, in false whorls of 6 to 10, all turned to one side and numerous in slender one-sided racemes, the floral leaves reduced to very small deciduous bracts. Foliage said to have a musky smell.

The genus comprises but very few species extending over tropical Asia and Africa. Of the two Australian species, one is common in East India, the other appears to be endemic.

Fruiting-calyx reflexed or very spreading, campanulate. Racemes

loose . . . . . 1. *M. polystachyum*.

Fruiting-calyx erect or slightly spreading, tubular-campanulate.

Racemes dense . . . . . 2. *M. australe*.

**1. *M. polystachyum*, Benth.; DC. Prod. xii. 48.** An erect slender much branched annual of 1 to 2 ft., slightly pubescent or nearly glabrous, the stems acutely 4-angled. Leaves on long petioles, ovate or ovate-lanceolate, acuminate, toothed, 1 to 2 in. long, the upper ones small. Racemes numerous, terminating the main branches as well as short axillary branchlets, slender and loose. Flowers white or very pale blue, about  $\frac{3}{4}$  line long. Calyx minute when in flower, when in fruit 1 to  $1\frac{1}{2}$  lines long, rather broadly campanulate, very spreading or reflexed, the upper lobe very broad and slightly decurrent. Corolla-tube about as long as the calyx, the lips about as long as the tube.—*Ocimum polystachyon*, Linn. Mant. 567; *Plectranthus parviflorus*, R. Br. Prod. 506, not of Willd.

**N. Australia.** Upper Victoria river, *F. Mueller* (a single specimen in herb. Hooker).

**Queensland.** Broad Sound, *R. Brown*; Wide Bay, *Bidwill*; Port Denison, *Fitzalan*; Rockingham Bay, *Dallachy*; Amity and Nerkool Creeks, *Bourman*; Rockhampton, *O'Shanesy*; Balonne river, *Mitchell*.

The species is a common weed in tropical Asia, extending into Africa.

2. ***M. australe***, *Benth.*; *DC. Prod.* xii. 48. An erect herb of 2 or 3 ft., closely allied to *M. polystachyum*, but coarser, the foliage and calyxes usually more pubescent and the racemes more dense and spike-like. Fruiting-calyx more erect, longer and not so broad in proportion as in *M. polystachyum*, the upper lobe not so broad, and the lower ones broader than in that species; the corolla-tube more slender, slightly exceeding the calyx, the lips shorter than the tube. Middle-lobe of the upper lip emarginate in *M. australe* (lip 4-lobed), entire in *M. polystachyum* (lip 3-lobed), according to *R. Brown*, a difference, however, which I have failed to perceive.—*Plectranthus moschatus*, *R. Br. Prod.* 506.

**N. Australia.** Islands of the Gulf of Carpentaria, *R. Brown*; Upper Victoria and Fitzmaurice rivers, *F. Mueller*; Liverpool river, N. coast, *A. Cunningham*.

### 3. **ORTHOSIPHON**, *Benth.*

Fruiting-calyx enlarged and reflexed, the upper tooth orbicular or ovate with the margins decurrent, forming an upper lip, the 4 lower teeth small and pointed. Corolla-tube straight or somewhat curved, longer than the calyx, 4 upper lobes united in a broad 3- or 4-lobed upper lip, lower lobe entire, flat or slightly concave, as long as or (in a species not Australian) longer than the upper lip. Stamens 4, declinate, without appendages; anther-cells confluent. Style clavate or capitate at the end, entire or slightly notched. Nuts small, granular-punctate.—Perennial herbs. Flowers in false-whorls of 6 or rarely fewer, in long interrupted or short and dense racemes, the floral leaves reduced to bracts.

The genus is chiefly Asiatic, with two or three African species and two slightly anomalous American ones. The only Australian species is a widely spread Asiatic one. The genus has the calyx and habit of *Ocinum*, from which it differs in the elongated corolla-tube and capitate stigma.

1. ***O. stamineus***, *Benth.*; *DC. Prod.* xii. 52. A loosely branched perennial of 1 to 3 ft., slightly hoary-pubescent or nearly glabrous. Leaves petiolate, ovate or ovate-lanceolate, often acuminate, 1 to 2 in. long, irregularly and coarsely toothed, or rarely regularly crenate or almost entire. Flowers white or pale blue, in whorls of 4 to 6, in loose but rather short terminal racemes, and by their long stamens resembling those of a *Clodendron*. Pedicels about as long as the flowering calyx, which scarcely exceeds  $1\frac{1}{2}$  lines. Corolla-tube slender, 4 to 5 lines long or even more, the lips very spreading, shorter than the tube. Stamens filiform, two or three times as long as the corolla-tube, with very small anthers. Style still longer, the stigmatic end small and clavate. Fruiting-calyx attaining  $\frac{1}{2}$  in., the upper lobe ovate, obtuse and decurrent, the lateral ones nearly as long, acute, with short points,











the lower ones connate to the middle, and produced into long incurved subulate points.

**Queensland.** Cape York, *M'Gillivray*, *Veitch*; Port Denison, *Fitzalan*; Burdekin river, *Bowman*; Rockingham Bay, *Dallachy*. Frequent in the Indian Archipelago, extending on the Asiatic continent to Assam and Silhet.

#### 4. PLECTRANTHUS, Lher.

Fruiting-calyx in the Australian species reflexed, the upper tooth broad and sometimes decurrent, the 2 lowest long and pointed, the lateral ones shorter, in some other species the teeth all nearly equal. Corolla-tube longer than the calyx, gibbous or produced into a spur on the upper side; upper lip 3- or 4-lobed, lower lip entire, concave, longer than or rarely rather shorter than the upper one. Stamens declinate, free, without any appendage; anther-cells confluent. Style shortly bifid. Nuts smooth or slightly granular.—Herbs, undershrubs or in species not Australian, shrubs. Flowers usually numerous, rarely only 6, in false-whorls, often developed into loose opposite cymes forming terminal panicles, in the Australian species more compact forming interrupted racemes, the floral leaves reduced to small deciduous bracts.

The genus is widely spread over tropical and subtropical Asia and Africa, one of the African species having been also found in Brazil (probably introduced). Of the three Australian species, one extends to the Pacific Islands, the two others appear to be endemic. The common Indian forms have none of them been as yet detected in Australia.

- |  |                            |
|--|----------------------------|
| Flowers in false-whorls of 6, lower calyx-lobes obtuse. Corolla with a long spur . . . . .             | 1. <i>P. longicornis</i> . |
| Flowers in false-whorls of 10 or more. Lower calyx-lobes very obtuse or aristate. Corolla not spurred. |                            |
| False-whorls loose, of about 10 flowers. Fruiting-calyx 2 to 3 lines long . . . . .                    | 2. <i>P. parviflorus</i> . |
| False-whorls dense, of about 20 flowers. Fruiting calyx about 1 line long . . . . .                    | 3. <i>P. congestus</i> .   |

1. ***P. longicornis***, *F. Muell. Fragm.* v. 51. A perennial, more or less pubescent or villous, with short rather rigid hairs. Leaves usually 2 or 3 pairs near the base of the stem, obovate or oblong, obtuse, sinuate or coarsely toothed especially near the base,  $1\frac{1}{2}$  to 3 in. long, contracted into a short petiole; below the lowest pair there are also usually 2 or 3 pairs of very small nearly sessile orbicular leaves. Flowering stems erect, often above 1 ft. high, simple or slightly branched, leafless except at the base, the floral leaves being all reduced to ovate reflexed bracts; rarely the stock emits also long weak decumbent stems with a few distant pairs of narrow leaves. Flowers deep purple (*Dallachy*) or blue (*F. Mueller*), in false-whorls of 6, forming long slender racemes. Pedicels 1 to 2 lines long. Calyx at first very small and open, when in fruit about 2 lines long, very much incurved, deeply 2-lipped, the upper lip formed of the broad obtuse slightly decurrent and recurved upper tooth with the 2 very small lateral lobes at its base, the lower lip as long as the upper, obtuse and emarginate, incurved and concave. Corolla-tube slender, nearly 2 lines long, produced at the base into a

long narrow conical spur; upper lip erect, broad, shortly 4-lobed, shorter than the tube; lower lip oblong-obovate, very concave, rather shorter than the upper. Stamens shorter than the corolla, the two upper ones inserted much lower down than the lower ones.

**Queensland.** Cape York, *M'Gillivray*; Rockingham Bay, *Dallachy*.

This species has precisely the calyx and something of the habit of *Coleus Africanus*, Benth. (which probably includes *Plectranthus Palisoti*, Benth.) In the latter plant however the foliage is different, the flowers much more numerous in the false-whorls, and as far as I can ascertain, the corolla and stamens are truly those of a *Coleus*.

**2. *P. parviflorus*, Willd.; Benth. in DC. Prod. xii. 67, not of R. Br.** An erect herb or undershrub very variable in size and indumentum, sometimes under 1 ft. and much branched at the base, sometimes attaining 2 or 3 ft.; the stems rather fleshy, the whole plant pubescent villous or tomentose or rarely nearly glabrous. Leaves in the lower part of the stem petiolate, ovate to orbicular, coarsely crenate, rounded or cordate at the base, from under 1 in. to 2 or even 3 in. diameter, usually rather thick soft rugose and tomentose or villous, but sometimes nearly glabrous and smooth. Flowers small, of a bluish purple, in false-whorls of about 10, forming long terminal leafless racemes either simple or slightly branched, the floral leaves reduced to minute bracts falling off from the very early buds. Pedicels usually longer than the very small flowering calyx; the fruiting calyx reflexed, much curved, striate, 2 to nearly 3 lines long, the upper tooth or lobe broad obtuse and slightly decurrent, the 4 lower ones incurved, very acute or subulate-acuminate, the 2 lateral ones as long as, the 2 lowest longer than, the upper one. Corolla-tube about twice as long as the calyx, declinate and slightly gibbous at the base but not spurred; upper lip short and erect, the 2 upper lobes rather larger than the lateral ones, the lower lip twice as long; very concave. Stamens nearly as long as the lower lip.—*P. graveolens*, R. Br. Prod. 506; *P. australis*, R. Br. Prod. 506, Bot. Reg. t. 1098, Benth. in DC. Prod. xii. 67.

**N. Australia.** Port Essington, *Armstrong*; Gilbert river, *F. Mueller*; Kennedy district, *Daintree*.

**Queensland.** Broad Sound, Shoalwater Bay, Northumberland island, *R. Brown*; Burdekin river, *Fitzalan*; Lizard island, *M'Gillivray*; Whitsunday island, *Henne*; Rockhampton, *Dallachy*, *Bowman*; Brisbane river, Moreton Bay, *F. Mueller*; top of Mount Faraday, *Mitchell*.

**N. S. Wales.** Port Jackson to the Blue Mountains, *R. Brown* and others; northward to Hastings, Macleay and Clarence rivers, *Beckler* and others; New England, *C. Stuart*; southward to Twofold Bay, *F. Mueller*.

**Victoria.** Snowy river, *F. Mueller*.

The species extends to New Caledonia and other islands of the South Pacific and to the Sandwich Islands, the differences formerly observed between the Australian and Sandwich Island plants disappearing in the larger series of specimens now before us.

**3. *P. congestus*, R. Br. Prod. 506.** A tall herb, attaining according to *Dallachy* 10 to 12 ft., usually hoary-tomentose. Leaves ovate, shortly acuminate or obtuse, coarsely crenate, narrowed into a petiole, soft and rugose, tomentose on both sides, about 2 or 3 in. long in the specimens seen but the lower ones probably longer. Flowers small,







blue, numerous (often above 20), in dense false-whorls, forming long almost spike-like interrupted racemes of which several are collected in a large terminal leafless panicle, the floral leaves reduced to minute very deciduous bracts. Pedicels very short. Calyx villous and copiously dotted and scarcely above 1 line long when in fruit, declinate or reflexed, the upper lobe broadly ovate, obtuse, not decurrent, the lateral ones acute but not much narrower, the 2 lowest narrower and rather longer, incurved and very acute. Corolla-tube about 2 lines long, abruptly declinate and slightly gibbous on the upper side below the middle but not spurred; upper lip about half as long as the tube, the 2 upper lobes broadly obovate, the 2 lateral ones very much smaller; the lower lobe or lip twice as long as the upper one and very concave.—Benth. in DC. Prod. xii. 66.

**Queensland.** Endeavour river, *Banks and Solander*; Rockingham Bay, *Dallachy*.

### 5. COLEUS, Lour.

Fruiting-calyx usually declinate or reflexed, the upper tooth broad, scarcely decurrent, the lateral ones truncate or acute, the two lower usually longer, more connate and acute. Corolla-tube longer than the calyx, declinate or bent down, not spurred; upper lip short, 3- or 4-lobed, the lower much longer, entire, very concave or boat-shaped. Stamens 4, more or less connate in a tube round the style; anther-cells confluent. Style shortly bifid at the top. Nuts small, smooth.—Herbs rarely shrubs. Flowers in false-whorls of 6 or more, sometimes very dense, sometimes growing out into opposite variously branched cymes, forming terminal leafless racemes or panicles, the floral leaves reduced to small deciduous bracts.

The genus extends over tropical Asia and Africa, the only Australian species being apparently the same as a common one in the Archipelago, although represented by endemic forms or varieties, which however require further investigation. The genus differs from *Plectranthus* chiefly in the monadelphous stamens.

1. **C. scutellarioides**, Benth.; DC. Prod. xii. 73. A tall herb or undershrub, the typical form pubescent or nearly glabrous, with slender branches. Leaves petiolate, ovate, acuminate or obtuse, slightly crenate-toothed and more or less purple underneath in the typical form, but varying much in the Australian varieties, mostly  $1\frac{1}{2}$  to 3 in. long. Flowers rather small and numerous at first, in rather compact false-whorls forming long slender terminal racemes, but in most varieties as the flowering advances the two primary branches on each side lengthen considerably, converting the false-whorl into two opposite sessile once forked cymes, with the pedicels arranged along each branch. Calyx very small when in flower, enlarged afterwards, deflexed, the tube striate, the broad upper lobe slightly decurrent, the lateral ones rather shorter and very obtuse, the 2 lowest much longer, connate to near the end where they form two small points. Corolla-tube slender, slightly gibbous at the base, then abruptly bent down, the throat dilated espe-

cially in the Australian varieties, of a pale bluish white as well as the upper lip, the lower boat-shaped lip or lobe of a deeper blue. Stamens not exceeding the lower lobe.—*Ocimum scutellarioides*, Linn.; Bot. Mag. t. 1446; *Plectranthus scutellarioides*, R. Br. Prod. 506.

**N. Australia.** *R. Brown* and others. The species appears to be widely distributed over the Indian Archipelago, and ought perhaps to include *C. atropurpureus*, Benth. and some others. The flowers are in the typical form rather smaller, and the fruiting cymes usually less developed than in Australia, where moreover the following varieties appear very distinct in the few specimens we possess.

Var. *angustifolia*. Leaves lanceolate, acuminate, pubescent underneath, coarsely toothed. False-whorls in some specimens compact, in others the cymes more developed.—Table Hill, Victoria river and Macadam Range, *F. Mueller*; Port Essington, *Armstrong*.

Var. *lara*. Glabrous. Leaves broad, not acuminate, coarsely toothed. Inflorescence loose, the 2 branches on each side of the false-whorl at length much elongated, flowers large.—Roe river, York Sound, N.W. coast, *A. Cunningham*; Roebuck Bay, N.W. coast, *Martin*; Arnhem's Land, *R. Brown*, *Mackinlay*.

Var. *linnophila*, *F. Muell*. Loosely villous, almost woolly. Leaves ovate, acuminate, coarsely toothed, rather large. Inflorescence at least as loose and flowers as large as in the preceding variety.—Nicholson and Macarthur rivers, *F. Mueller*.

#### \* 6. **HYPTIS**, Jacq.

Fruiting-calyx erect, with 5 subulate or acute teeth. Corolla-tube cylindrical, the 4 upper lobes flat and erect or spreading, the lowest lobe saccate, contracted at the base and abruptly deflexed. Stamens 4, declinate, without appendages; anther-cells confluent. Nuts various.—Herbs, undershrubs or shrubs, exceedingly diversified in habit and inflorescence, but always known by the saccate lower lobe of the corolla.

A very large genus, entirely American, tropical or subtropical, a few of the species are however now spread over various tropical regions of the Old World, especially Africa, and amongst the most weedy of these is the only one hitherto found in Australia.

\* 1. **H. suaveolens**, *Poit.*; *Benth.* in *DC. Prod.* xii. 126. A coarse erect herb of 2 to 6 ft., more or less hirsute. Leaves petiolate, broadly ovate, irregularly toothed, often cordate, 1 to 3 in. long, the upper floral ones gradually smaller and passing into small bracts. Peduncles in the upper axils 2 to 4 lines long or almost none, bearing little heads of 3 to 5 small flowers, sometimes all in irregular axillary false-whorls, sometimes forming irregular almost leafless panicles or spikes. Fruiting calyx 3 to 4 lines long, obliquely campanulate, truncate and ciliate on the margin, with 5 subulate teeth. Corolla about 3 lines long, the lips shorter than the tube.

**N. Australia.** Garden Bay, Port Essington, *Leichhardt*. A common tropical American weed, now found in many parts of the Old World, and probably introduced into Australia from the Indian Archipelago.

TRIBE II. SATURIEÆ.—Corolla-lobes spreading, not hood-shaped, equal or more or less two-lipped. Stamens 4 or 2, distant, erect, divaricate or connivent in pairs under the upper lip, the upper pair shorter or abortive. Anthers 2-celled, or rarely as in *Ocimoidæ*















1-celled by the confluence of the cells. Nuts dry, smooth or minutely granular.

### 7. DYSOPHYLLA, Blume.

Calyx equally 5-toothed. Corolla with a short tube; the limb of 4 equal or nearly equal lobes. Stamens 4, nearly equal, exserted, the filaments bearded; anthers small, terminal, nearly globular, 1-celled. —Herbs. Leaves opposite or whorled. Flowers in dense false-whorls, forming close cylindrical terminal spikes.

The genus comprises several tropical Asiatic species, including among them the only Australian one. The commonest and widest spread of them, *D. auricularia*, Blume, has however, not yet been detected in Australia. Hasskarl has proposed the uniting the genus with *Pogostemon*, of which it would at any rate form a very marked section, characterised by the inflorescence and habit as well as by the more regular corolla.

1. **D. verticillata**, Benth.; *DC. Prod.* xii. 157. A glabrous or somewhat pubescent herb, decumbent at the base or floating in water, ascending to 1 ft. or more. Leaves in whorls of 4 to 6 or rarely more, sessile, linear or linear-lanceolate, entire, with recurved margins, 1 to 2 in. long or even more. Flowers very small and numerous, the false-whorls crowded in dense cylindrical spikes of  $\frac{3}{4}$  to 2 in., the tips of the bracts subtending the false-whorls sometimes appearing in the young spikes in 4, 6 or 8 rows. Calyx softly villous, scarcely one line long when in fruit, and much smaller in the flower. Corolla-tube shorter than the calyx, the lobes as long as the tube. Stamens shortly exceeding the corolla-lobes, the filaments bearded with reddish purple hairs.

**N. Australia.** Boggy situations, S. Goulburn island, *A. Cunningham*; Lagoons, Mitchell's river, Gulf of Carpentaria, *Leichhardt*, in both cases the common form with glabrous stems and foliage.

**Queensland.**—Edges of waterholes, Rockingham Bay, *Dallachy*, a pubescent variety also found in India, but not so common as the glabrous one.

The species is widely spread over East India and the Archipelago. Thwaites is probably right in uniting with it as varieties *D. crassicaulis*, Benth., and *D. tetraphylla*, Wight, *lc. t.* 1444.

### 8. MENTHA, Linn.

Calyx regular or slightly 2-lipped, 5-toothed. Corolla-tube not at all or scarcely exceeding the calyx; limb 4-lobed, the lobes all equal and spreading or the upper one broader and notched. Stamens 4, equal, erect, distant; filaments glabrous; anthers with 2 parallel cells. Style shortly bifid. Nuts smooth.—Herbs, usually copiously dotted and strongly scented. Flowers small, in false-whorls usually dense rarely few-flowered, all axillary or in species not Australian, forming terminal spikes, with the floral leaves reduced to bracts. Bracts within the false-whorls minute, or rarely subulate and as long as the calyx.

The genus is chiefly extratropical and most abundant in Europe and Northern Asia, with one or two North American species scarcely different from Asiatic ones, so also the very few tropical Asiatic forms are but slight modifications of common northern

ones. The six following Australian species are all endemic. They appear as difficult to define by positive characters, and to pass into each other as gradually as the species allied to *M. arvensis* in the northern hemisphere. They all belong to the group with axillary false-whorls, and one of them comes very near indeed to the almost ubiquitous *M. arvensis*, the genuine forms of which have not however as yet appeared in Australia.

Leaves all toothed. Flowers numerous in the false whorls.

Pedicels usually as long as the calyx. . . . . 1. *M. laxiflora*.

Leaves mostly toothed. Flowers less numerous, the corolla fully 5 lines long. Pedicels short. . . . . 2. *M. grandiflora*.

Leaves all or mostly entire. Pedicels very short (except where the flowers are very few).

Flowers numerous, rather large. Calyx-teeth subulate. Corolla under 4 lines long. Leaves lanceolate . . . . . 3. *M. australis*.

Flowers less numerous and smaller. Calyx-teeth lanceolate-subulate. Leaves small ovate . . . . . 4. *M. gracilis*.

Flowers few in the false-whorls and small. Calyx-teeth lanceolate, somewhat hairy inside. Leaves nearly sessile . . . . . 5. *M. serpyllifolia*.

Flowers few in the false-whorls and small. Calyx-teeth short, densely hairy inside. Leaves ovate to oblong-linear . . . . . 6. *M. saturcioides*.

Besides the above, the two following European species have been sent amongst the plants introduced into Australia.

*M. viridis*, Linn.; Benth. in DC. Prod. xii. 168. Stems erect, 1 to 2 feet high, glabrous as well as the foliage. Leaves sessile or nearly so, ovate-lanceolate, irregularly serrate. False-whorls in a loose cylindrical terminal leafless spike, the floral leaves reduced to small narrow bracts. Calyx usually hairy.—Borders of streams, Mount Lofty Range, *F. Mueller*.

*M. aquatica*, Linn.; Benth. in DC. Prod. xii. 170. Erect, 1 to 2 ft. high, more or less hirsute. Leaves petiolate, ovate or ovate-lanceolate, serrate, the floral ones similar except the upper ones, which are reduced to small bracts. Flowers numerous in a rather large terminal nearly globular false-whorl, with the addition frequently of one or more similar false-whorls a little lower down or in the upper axils.—Borders of streams, &c., Karrie Dale and throughout the Warree country, W. Australia, *Walcott*; Tone river, *Maxwell*.

1. ***M. laxiflora***, Benth. in DC. Prod. xii. 174. Stems weak, procumbent, from under 1 ft. to near 2 ft. high, more or less hirsute on the angles as well as the foliage. Leaves petiolate, ovate or ovate-oblong, obtuse, toothed, the floral ones similar. Flowers in loose axillary false-whorls, the pedicels usually as long as or even longer than the calyx. Calyx hispid, about  $1\frac{1}{2}$  lines long, the lobes lanceolate, as long as the tube, scarcely villous inside. Corolla twice as long as the calyx, the limb 4-lobed, the upper lobe scarcely notched.

**Victoria**.—Port Philip, *Gunn*; Buffalo Range, Mount William, Mount Disappointment, Ballarat, &c., *F. Mueller*; Ararat, *Green*.

This is not easily to be distinguished from some rather anomalous loose-flowered European forms of *M. arvensis*, the foliage is quite different from that of the more common Australian species.

2. ***M. grandiflora***, Benth. in Mitch. Trop. Austr. 363 and in DC. Prod. xii. 698. Softly pubescent. Leaves petiolate, ovate, mostly toothed,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. False-whorls all axillary, loose and not many-flowered, but the pedicels all shorter than the calyx. Calyx about  $2\frac{1}{2}$  lines long, the teeth lanceolate or lanceolate-subulate, scarcely villous inside. Corolla fully 5 lines long, the tube rather longer than

the calyx, the upper lobe deeply notched or shortly bifid. Stamens and style much longer than the corolla.

**Queensland.** On the Maranoa, *Mitchell*. The specimens are but few, and may hereafter prove to be exceptional, but the flowers are much larger than those of any *Mentha* known to me, and the foliage is nearer that of *M. laxiflora* than of *M. australis*, with which F. Mueller unites the species, without however having seen the specimens.

3. *M. australis*, *R. Br. Prod.* 505. Stems erect or ascending, branched, 1 to 2 feet high, usually scabrous on the angles. Leaves lanceolate or rarely ovate-lanceolate, quite entire or here and there sparingly toothed, contracted into a short petiole or almost sessile, glabrous or hoary-pubescent especially underneath, often above 1 in. long. Flowers in axillary false-whorls, usually numerous, on very short pedicels or quite sessile. Calyx narrow, hoary-pubescent or villous, 2 to nearly 3 lines long, the teeth subulate or narrow-lanceolate, very acute, slightly villous inside. Corolla-tube not exceeding the calyx, the lobes shorter than the tube, the upper one more or less deeply 2-lobed, the whole corolla under 4 lines long.—Benth. in DC. *Prod.* xii. 174; *Hook. f. Fl. Tasm.* i. 281; *Micromeria australis*, Benth. *Lab. Gen. et Sp.* 380.

**Queensland.** In the interior, *Mitchell*.

**N. S. Wales.** Hawkesbury river, *R. Brown*; Darling river, *Mrs. Ford*; on the Murrumbidgee, *F. Mueller*.

**Victoria.** *Mitchell*; Wendu vale, *Robertson*, Yarra river and Sandy Creek, *F. Mueller*.

**Tasmania.** Port Dalrymple, *R. Brown*; common in marshy places, *J. D. Hooker*.

**S. Australia.** From the Murray river, *Behr.*, to St. Vincent's Gulf, *F. Mueller* and others; towards Spencer's Gulf, *Warburton*; Cooper's Creek, *Howitt's Expedition*.

The differences observed in the upper lobe of the corolla of this and the allied species, deeply lobed, notched only, or entire, require further observation to ascertain whether they are really of specific constancy.

4. *M. gracilis*, *R. Br. Prod.* 505. Very nearly allied to *M. australis*, of which Archer considers it as a variety, but a smaller more diffuse and branching plant, rarely attaining 1 ft., hoary-pubescent or glabrous like that species, but the stems much smoother. Leaves petiolate, ovate or rarely ovate-lanceolate, entire or scarcely toothed, under 1 in. and often not  $\frac{1}{2}$  in. long. Flowers much smaller than in *M. australis* and rather fewer in the false-whorls, the pedicels exceedingly short or scarcely any. Calyx  $1\frac{1}{2}$  to about 2 lines long, the teeth lanceolate or lanceolate-subulate, not very hairy inside. Corolla-tube shorter than the calyx, the lobes much shorter than the tube, the upper one scarcely notched.—Benth. in DC. *Prod.* xii. 174; *Hook. f. Fl. Tasm.* i. 281; *M. diemenica*, Spreng. *Syst.* ii. 724; *Micromeria gracilis*, Benth. *Lab. Gen. et Sp.* 380.

**Victoria.** Mouth of the Glenelg river, *Allitt*; near Melbourne, *Adamson* (with larger narrower leaves, but small flowers); Creswick, *Whan*; Gipps Land, *F. Mueller*.

**Tasmania.** Port Dalrymple, *R. Brown*; in stony places not unfrequent, *J. D. Hooker*.

**S. Australia.** Onkaparinga river, *F. Mueller*; Rapide Bay, *Malpas*. The northern specimens referred to this species by F. Mueller (*Fragm.* vi. 109) appear to me all to belong to *M. satpureioides*.

5. ***M. serpyllifolia***, *Benth. in DC. Prod.* xii. 174. A slender diffuse perennial, often creeping at the base, the filiform ascending stems rarely above 6 in. long, glabrous or very slightly pubescent. Leaves very shortly petiolate or almost sessile, ovate, entire or rarely obscurely toothed, under  $\frac{1}{2}$  in. and often not  $\frac{1}{4}$  in. long. Flowers small, few, in axillary false-whorls of 4 to 6 or sometimes reduced to 2 opposite flowers. Calyx about  $1\frac{1}{2}$  lines long, the teeth lanceolate, acute, villous inside but much less so than in *M. satureioides*. Corolla not twice as long as the calyx, the upper lobe usually shortly bifid.—Hook. f. *Fl. Tasm.* i. 281; *Micromeria sessilis* and *M. affinis*, Hook. f. in Hook. *Lond. Journ.* vi. 274.

**Victoria.** King river, Guichen Bay, Mount Disappointment, Wilson's Promontory, &c., *F. Mueller*.

**Tasmania.** Not uncommon in marshes in various parts of the island, *Gunn*.

**S. Australia.** Torrens river, *F. Mueller*.

Possibly a variety of *M. gracilis*. The Victorian and S. Australian specimens are less characteristic than the Tasmanian ones.

6. ***M. satureioides***, *R. Br. Prod.* 505. A small much-branched erect or diffuse perennial, under 1 ft. and often only a few inches high, glabrous or minutely hoary-pubescent. Leaves petiolate or sometimes almost sessile, usually oblong or oblong-lanceolate, but varying from ovate to almost linear, obtuse, entire, under  $\frac{1}{2}$  in. long when broad, sometimes nearly 1 in. when narrow. Flowers usually 6 or fewer rarely rather more, in axillary false-whorls. Pedicels shorter than the calyx and often very short. Calyx  $1\frac{1}{2}$  to nearly 2 lines long, the teeth shortly lanceolate or triangular, always densely villous inside with white hairs, readily distinguishing this species from all others. Corolla small, the upper lobe usually shortly bifid.—*Benth. in DC. Prod.* xii. 174; *Micromeria satureioides*, *Benth. Lab. Gen. et Sp.* 380; *Bartl. in Pl. Preiss.* i. 354.

**Queensland.** Burnett river and Moreton Bay, *F. Mueller*; Rockhampton, *Thos. et Darling Downs, Lau*.

**N. S. Wales.** Port Jackson to the Blue Mountains, *R. Brown, Sieber*, n. 491, and others; northward to Hastings, Macleay and Clarence rivers, *Beckler*; New England, *C. Stuart*; Castlereagh river, *C. Moore*; in the interior to Lachlan river, *A. Cunningham*; on the Murrumbidgee, *F. Mueller*.

**Victoria.** Bacchus Marsh, Loddon river, Creswick Creek, Macalister river, &c., *F. Mueller*; Wimmera, *Dallachy*.

**S. Australia.** Near Bethanie, *Behr.*; Onkaparinga river, St. Vincent's Gulf, Port Lincoln, &c., *F. Mueller*.

**W. Australia.** King George's Sound, *Huegel*; Blackwood river, *Walcott*; Swan river, *Drummond*, 1st coll. n. 458, *Preiss*, n. 2322 a, 2323, 2324.

## 9. LYCOPUS, Linn.

Calyx equally 4- or 5-toothed. Corolla-tube short, limb nearly equally 4-lobed. Two upper stamens reduced to small filiform staminodia sometimes capitate at the top; the 2 lower ones perfect, distant, with 2-celled anthers. Style shortly bifid. Nuts smooth, with three callous angles and truncate at the top.—Perennial herbs,











usually emitting stolones. Flowers small, usually numerous, in dense axillary false-whorls. Bracts within the false-whorls minute, or the outer ones as long as the calyx.

The genus consists of very few species, or varieties, dispersed over the temperate regions of the northern hemisphere, the only Australian species scarcely differing from some of the northern forms.

1. **L. australis**, *R. Br. Prod.* 500. An erect herb, attaining sometimes 2 or 3 ft., glabrous or sprinkled with a few minute hairs. Leaves lanceolate, acuminate, bordered by a few rather coarse acute teeth, contracted into a short petiole or nearly sessile, often 3 or 4 in. long, usually scabrous with very short rigid hairs or small tubercles. Flowers in dense axillary false-whorls, intermixed with subulate or linear-lanceolate bracts, of which the outer ones often exceed the calyx. Calyx  $1\frac{1}{2}$  lines long or rather more, with 5 acute lanceolate teeth longer than the tube. Corolla scarcely exceeding the calyx, the lobes shorter than the tube. Staminodia small, usually clavate at the end, but apparently variable; perfect stamens longer or shorter than the corolla.—Benth. in DC. *Prod.* xii. 178; Hook. f. *Fl. Tasm.* i. 282.

**Queensland.** Burnett river, *Daly*.

**N. S. Wales.** Port Jackson, *R. Brown* and others; New England, *Stuart*.

**Victoria.** Port Phillip, *R. Brown*; Wendu river, *Robertson*; near Melbourne, *F. Mueller*.

**Tasmania.** Derwent river, *R. Brown*; not uncommon in moist shady places, *Gunn*.

**S. Australia.** Third Creek, *F. Mueller*.

TRIBE III. MONARDEÆ.—Stamens 2; anthers with one linear or oblong-linear perfect cell, the other cell either entirely abortive or barren and deformed, or rarely perfect in species or genera not Australian, the connective usually elongated and filiform. Corolla usually 2-lipped. Nuts smooth or minutely granular.

## 10. SALVIA, Linn.

Calyx 2-lipped, the upper lip entire or with 3 minute teeth, the lower lip 2-cleft. Corolla with the upper lip erect, concave or arched, entire or scarcely notched, the lower lip spreading, 3-lobed, the middle lobe often notched or divided. Stamens 2, but easily mistaken for 4, the real filaments very short, the filiform connective appearing like branches of the filament, with a single oblong-linear anther-cell at the upper end, and at the lower end a small empty cell, usually much deformed or quite rudimentary, rarely almost perfect.—Herbs, shrubs or trees, exceedingly diversified in habit and inflorescence.

A very large genus, widely distributed over the temperate and warmer regions of the globe, although within the tropics the majority of species are mountain plants. In Australia however it is exceptionally limited to a single species, and that a common one in tropical Asia, and belonging, moreover, to an Asiatic section sparingly represented in Africa.

1. **S. plebeia**, *R. Br., Prod.* 501. An erect branching pubescent or hairy coarse annual, 1 to 2 or even 3 ft. high, the inflorescence some-

times glandular-viscid. Leaves petiolate, oblong or lanceolate, obtuse or acute, rugose,  $1\frac{1}{2}$  to 3 in. long. Flowers exceedingly small, in false-whorls of 6, forming branched paniculate racemes. Calyx pubescent, ovoid and 1 line long when in flower, reflexed campanulate and 2 lines long when in fruit, the upper lip entire, recurved, obtuse or obscurely pointed. Corolla scarcely longer than the calyx, the upper lip short erect and concave. Connectives of the anthers free at the lower end with a small barren anther-cell.—Benth. in DC. Prod. xii. 355.

**Queensland.** Burdekin river, *F. Mueller*; Rockhampton, *Thozet*, *O'Shanesy*; Kennedy District, *Daintree*; Darling Downs, *Lau*.

**N. S. Wales.** Hawkesbury, Nepean and Paterson rivers, *R. Brown*; Nepean river, *Woods*; Argyle county, *A. Cunningham*; Hastings river, *Beckler*; New England, *C. Stuart*.

**Victoria.** Tambo, Snowy and Broadribbe rivers, *F. Mueller*.

The species is common in E. India, extending from Cabul to the Philippines and northward to Pekin and Japan.

Amongst the introduced plants in F. Mueller's and others herbaria are the following species of *Salvia*:—

*S. verbenaca*, Linn.; Benth. in DC. Prod. xii. 294, a coarse erect slightly branched perennial of 1 to 2 ft. Lower leaves petiolate, ovate, coarsely toothed or lobed, rugose, the upper ones sessile broader and shorter. Flowers small, blue, in false-whorls of about 6, forming terminal slightly branched racemes, the floral leaves reduced to heart-shaped bracts, the upper lip of the calyx with minute connivent teeth, the corolla not twice the length of the calyx, with a somewhat arched upper lip. Connectives of the anthers dilated and cohering at the lower end. A common European weed said to be naturalised near Bathurst, at Swan Hill, &c.

*S. pratensis*, Linn.; Benth. l.c. 289. Near *S. verbenaca*, with a similar floral structure, but the stems less leafy, the leaves being chiefly radical, and the flowers very much larger, of a deep blue, with a long arched upper lip. Also a common European plant of which there is an Australian fragment in Herb. F. Mueller, with the following.

*S. sclarea*, Linn.; Benth. l.c. 281. A coarse herb more branched than the preceding. Leaves mostly radical, broad, soft, very rugose and often woolly white, the bract-like floral ones broad and more or less coloured. Calyx much larger than in the preceding, more open, with the upper lip deeply 3-toothed. Corolla pale blue, rather large, the upper lip arched. A native of the Mediterranean region, established (in Victoria ?) as an escape from gardens.

*S. coccinea*, Linn.; Benth. l.c. 343. Erect branching and almost shrubby, hoary-pubescent. Leaves rather small. Corolla scarlet, the upper lip short and erect, the lower large and broad. A North American plant, a very old inmate of gardens, said to have established itself about Rockhampton.

**TRIBE IV. STACHYDEÆ.**—Stamens 4, didynamous, ascending under the upper lip of the corolla, the lowest pair the longest. Anthers 2-celled. Corolla with the upper lip concave or keeled. Nuts dry, smooth or granular-tuberculate.

## 11. PRUNELLA, Linn.

(*Brunella* of older authors.)

Calyx 2-lipped, the upper lip flat, truncate, shortly 3-toothed, the lower with 2 lanceolate lobes. Corolla-tube as long as or longer than the calyx, the upper lip erect, short, broad, concave, nearly entire, the lower one spreading, 3-lobed. Stamens 4, in pairs, ascending under the upper lip, each filament with a small tooth under the anthers.





Anther-cells distinct, divaricate. Style bifid at the top. Nuts oblong, smooth.—Perennial herbs, usually decumbent at the base. Flowers in false-whorls of 6, forming dense terminal spikes, with bract-like floral leaves.

A genus of very few species, very widely dispersed over the temperate regions and tropical mountains of both the New and the Old World. The only Australian species is the common one over the whole range of the genus.

1. **P. vulgaris**, *Linn.*; *Benth. in DC. Prod.* xii. 410. Stems procumbent or shortly creeping at the base, the flowering branches ascending sometimes to above 1 ft., more or less sprinkled as well as the foliage with short rigid hairs, rarely glabrous. Leaves petiolate, lanceolate or ovate-lanceolate, acute or obtuse, entire or somewhat toothed, 1 to 3 in. long. Flowers purplish blue or rarely white, in false-whorls of 6, forming a dense terminal spike, the bract-like floral leaves broad, shortly pointed, often coloured, about as long as the calyx. Fruiting-calyx usually about 4 lines long, the upper lip broad and flat, the lobes of the lower lip linear-lanceolate, acute, as long as the upper lip. Corolla varying from a little longer than the calyx to twice as long.—*R. Br. Prod.* 507; *Hook. f. Fl. Tasm.* i. 282.

**N. S. Wales.** Port Jackson to the Blue Mountains, *R. Brown* and others; Hastings, Macleay, and Clarence rivers, *Beckler*; New England, *C. Stuart*.

**Victoria.** Towards the Glenelg, *Robertson*; moist shady places, Creswick Creek, Ballan, &c., *F. Mueller*; Emu Creek, *Whan*.

**Tasmania.** Port Dalrymple, *R. Brown*; common throughout the island by waysides, in pastures, &c., *J. D. Hooker*.

**S. Australia.** Torrens river, *F. Mueller*; Rapide Bay, *Malpas*.

The species is common in Europe, northern Asia and North America, extending within the tropics into the mountainous regions of Asia and South America.

## 12. SCUTELLARIA, *Linn.*

Calyx divided into 2 entire lips, the upper one bearing on its back a hollow scale-like protuberance. Corolla with a rather long tube, and small nearly closed lips, the upper one concave, emarginate, the lower lip convex, spreading, emarginate at the end, the lateral lobes more frequently connate with the upper lip than with the lower. Stamens 4, in pairs, ascending under the upper lip; anthers ciliate, those of the upper pair 2-celled, those of the lower 1-celled by the abortion of the second cell. Style with the upper stigmatic lobe exceedingly short. Nuts granular-tuberculate, raised on a short oblique stalk.—Herbs or rarely shrubs. Flowers solitary within each floral leaf, either opposite and axillary or in terminal racemes or spikes.

The genus is widely distributed over the temperate and some of the warmer regions both of the New and the Old World. The Australian species are both endemic, although one of them bears considerable resemblance to a common northern one.

Pubescent. Leaves often above 1 in. long. Corolla about 5 lines long, the lower lip much longer than the upper . . . . . 1. *S. mollis*.

Glabrous or nearly so. Leaves rarely above  $\frac{1}{2}$  in. Corolla about 3 lines long, the lower lip rather longer than the upper . . . . . 2. *S. humilis*.

1. ***S. mollis*, R. Br. Prod. 507.** A perennial with a slender creeping rootstock and weak slightly branched ascending stems of 1 ft. or more, the angles acute and pubescent. Leaves petiolate, ovate or the upper ones ovate-lanceolate, the lower ones sometimes cordate, coarsely toothed, pubescent with short hairs or more densely villous when young, the larger ones above 1 in. long, the upper floral ones gradually smaller and narrower, almost passing into bracts. Pedicels axillary, turned both to one side, 2 to 3 lines long. Calyx hirsute, scarcely as long as the pedicel. Corolla pale blue, about 5 lines long, the tube shortly exserted, the lower lip considerably longer than the upper one.—Benth. in DC. Prod. xii. 428.

**N. S. Wales.** Port Jackson to the Blue Mountains, *R. Brown, A. and R. Cunningham*, and others.

**Victoria.** Nangatta mountains, *F. Mueller*.

2. ***S. humilis*, R. Br. Prod. 507.** A perennial with a slender creeping rootstock and ascending stems, like *S. mollis*, but much smaller in all its parts and nearly glabrous or only minutely pubescent. Stems usually under 6 in. and rarely when very luxuriant nearly a foot long and then not so weak as in *S. mollis*. Lower leaves petiolate, broadly ovate or almost orbicular, usually cordate, marked with a few deep crenatures or almost lobed, rarely above  $\frac{1}{2}$  in. long, the lower floral ones often the largest on long petioles and almost deltoid, the upper ones gradually smaller, narrower and with shorter petioles, but none quite sessile. Pedicels axillary, both turned to one side, 1 to 3 lines long. Calyx minutely pubescent. Corolla about 3 lines long, the lower lip rather longer than the upper one.—Benth. in DC. Prod. xii. 427; Hook. f. Fl. Tasm. i. 283.

**N. S. Wales.** Port Jackson, *R. Brown*; Mudgee, *Woolfs*; Liverpool plains, *A. Cunningham*; New England, *C. Stuart*.

**Victoria.** Yarra river, Darebin Creek, Bacchus marsh, &c., *F. Mueller* and others.

**Tasmania.** Port Dalrymple, *R. Brown*; very common in rich soil in the northern parts of the island, *J. D. Hooker*. Some of *Story's* specimens remarkably luxuriant and nearly 1 ft. high.

**S. Australia.** Kangaroo island, *R. Brown, Sealy*.

The species is nearly allied to the European and Asiatic *S. minor* and to the N. American *S. parvula*.

### 13. ANISOMELES, R. Br.

Calyx 5-nerved, 5-toothed. Corolla-tube about as long as the calyx, the upper lip erect, entire, short and somewhat concave; lower lip longer, spreading, 3-lobed, the middle lobe larger than the others, emarginate or 2-lobed. Stamens 4, in pairs, projecting from the upper lip of the corolla; anthers of the upper pair 1-celled, of the lower pair 2-celled, all the cells parallel and transverse. Nuts smooth.—Coarse herbs. Flowers in false-whorls either dense or developed into opposite cymes, all axillary or forming terminal racemes.

The genus consists of very few but very variable species, common in tropical Asia, scarcely extending into E. Africa. The Australian forms, whether regarded as one or







as four or five species, are supposed to be endemic, but they approach very near to a few of the narrower-leaved E. Indian varieties of *A. ovata* and *A. Heyneana*.

1. ***A. salvifolia***, *R. Br. Prod.* 503. A coarse erect herb, attaining 2 to 3 ft. or even more, very variable in indumentum and in the development of the inflorescence, frequently hoary-tomentose or almost woolly without spreading hairs, or when the plant is greener often hispid with spreading hairs especially on the angles of the stem, the calyxes and inflorescence more or less glandular-viscid in the hispid forms, the glands less conspicuous or entirely concealed in the tomentose ones. Leaves lanceolate or ovate-lanceolate, or rarely almost ovate in the small flowered forms, coarsely toothed, the larger ones 2 to 4 in. long contracted into a petiole, the floral ones passing into small bracts, all from thick soft and densely woolly tomentose on both sides to green and pubescent only or almost glabrous. Flowers variously described as pink, blue or pale purple, in loose false-whorls generally turned to one side, the lower ones sometimes axillary, the upper ones forming interrupted or dense irregular terminal racemes or thyrsoid panicles. As the flowering advances the primary branches of each cyme often lengthen out to above  $\frac{1}{2}$  in., with the flowers all erect on the upper side. Pedicels very short, each in the axil of a small linear bract. Calyx usually about 2 lines when the flower first opens, but lengthening to 3, 4 or even 5 lines, the tube 5-angled, the teeth lanceolate or more or less subulate, shorter than the tube. Corolla-tube scarcely so long as the calyx and the upper lip still shorter; lower lip at least twice as long as the upper. Nuts shining.—Benth. in DC. *Prod.* xii. 455.

**N. Australia.** From the N.W. coast to the Gulf of Carpentaria.

**Queensland.** From Cape York to Moreton Bay, but not seen from far into the interior.

The very different aspects given to the specimens by the diversities in the indumentum must at first suggest the existence of several species, and, had we only Brown's specimens, we should without hesitation have adopted the three he has proposed; but with the very large number from various localities now before me, I am unable to assign any positive limits to any of the following:—

1. Covered with a very dense soft white or hoary tomentum, sometimes thick and almost woolly, sometimes close and cottony—the typical *A. salvifolia*, Br.—Islands of the Gulf of Carpentaria, *R. Brown*; Arnhem's Land, *M'Kinlay*; Victoria river and Sturt's Creek, *F. Mueller*; Escape Cliffs, *Halls*; Kennedy district, Queensland, *Daintree*; Nerkool Creek, *Bowman*; Rockingham Bay, *Dallachy*.

2. More loosely tomentose, the hairs scarcely spreading, the tomentum less white, passing through some specimens into the next form.—N.W. coast and Port Essington, *A. Cunningham*; Sweers island, *Henne*; and the commonest form throughout Queensland, not far from the coast, and in the adjoining islands, *A. Cunningham*, *Fraser*, *M'Gillivray*, *Bidwill*, *F. Mueller*, *Henne*, *Dallachy*, *Bowman*, and many others.

3. Greener, pubescent, or nearly glabrous, scarcely tomentose, but without spreading hairs, the inflorescence usually looser and the flowers smaller than in the densely tomentose forms.—Rockingham Bay, *Dallachy*; Trinity island, *M'Gillivray*. To this form I should refer *A. moschata* and *A. inodora*, *R. Br. Prod.* 503, Benth. in DC. *Prod.* xii. 455, the former from Keppel and Shoalwater Bays, leading towards the common Queensland form (n. 2), the latter from Prince of Wales island and Arnhem N. Bay, more nearly glabrous than any other, all very near to the E. Indian *A. Heyneana*.

4. Scarcely tomentose, green, more or less hirsute with spreading hairs.—Rockingham Bay, *Dallachy*; Gilbert river, *F. Mueller*; the latter specimens more hispid still than *Dallachy's*.

14. **LEUCAS**, R. Br.

Calyx erect, straight or curved and oblique at the top, 8- to 10-ribbed, 8- to 10-toothed. Corolla-tube not longer than the calyx, the upper lip erect, concave, entire or rarely notched, very villous outside; lower lip spreading, 3-lobed. Stamens 4, ascending in pairs under the upper lip; anthers 2-celled. Style with the upper stigmatic lobe much shorter than the lower. Nuts dry, smooth, triangular, obtuse.—Herbs or undershrubs. Flowers in axillary false-whorls, white or rarely purplish.

A considerable genus, spread over tropical and subtropical Asia and Africa. The only Australian species is closely allied to, if not identical with, one of the Asiatic forms.

1. ***L. flaccida***, R. Br. *Prod.* 505. An annual with a hard branching decumbent base and ascending or erect flowering branches, often virgate or wiry and above a foot long, the whole plant pubescent or tomentose with soft appressed hairs. Leaves shortly petiolate, ovate, crenate,  $\frac{1}{2}$  to 1 in. long, the upper floral ones small. Flowers 6 to 20 or even more together in axillary false-whorls, the pedicels exceedingly short, the subtending floral leaves usually exceeding the flowers, the bracts within the false whorls very small. Calyx about 3 lines long when in flower and not much enlarged afterwards, straight, 10-ribbed, with 10 short softly subulate teeth, all equal or the alternate ones rather smaller. Corolla white (or blue according to Dallachy), not half as long again as the calyx.—Benth. in DC. *Prod.* xii. 526.

**Queensland.** Endeavour river, *Banks and Solander*; Rockingham Bay, *Dallachy*; Rockhampton, *Bowman*, *O'Shanesy*.

A few specimens of apparently the same species have been received from the Eastern Archipelago and from Burmah, and the whole may not be specifically distinct from the common Pacific island *L. decedentata*, Sm. (*Stachys decedentata*, Forst.), which however has much smaller calyxes with shorter teeth.

Var. ? *petiolaris*. Petioles longer than the calyx, as in *L. decedentata*, but the fragmentary specimens appear to be in an abnormal state, and the calyxes are those of *L. flaccida*.—Cape York, *M'Gillivray*.

TRIBE V. PROSTANTHEREÆ.—Stamens 4, in pairs, all bearing anthers, but sometimes one cell of all the anthers or both cells of the lower pair sterile or abortive. Nuts prominently reticulate-rugose or rarely nearly smooth, the pericarp rather thick. Seeds albuminous. Calyx usually 10- or 13-nerved, very rarely 15-nerved. Corolla with a broad throat, the upper lip erect, concave or nearly flat, broad and emarginate or 2-lobed; lower lip spreading, 3-lobed, longer than or very rarely shorter than the upper lip.

R. Brown describes the albumen of *Prostanthera* as "parcum aut nullum." I have found it present in the seeds of a considerable number of species of the different genera of the tribe which I have now examined, sometimes scanty, often rather copious, although never perhaps so thick as is figured by Labillardière. F. Mueller has also represented the albumen of *Prostanthera spinosa* rather thicker than I observed it, but the exact proportion of the embryo to the albumen may vary in different seeds of the same plant, according to the condition under which they ripened.









*Rosanthera lasiantha*

1847. 22.



## 15. PROSTANTHERA, R. Br.

(Chilodia and Cryphia, R. Br. Klanderia, F. Muell.)

Calyx-tube usually striate, the limb 2-lipped, the lips entire or the lower one slightly emarginate. Corolla-tube short, dilated into a broad campanulate throat, the upper lip erect, usually short, slightly concave, broadly 2-lobed; the lower lip spreading, 3-lobed, longer or in one section shorter than the upper lip, the middle lobe larger and usually emarginate or 2-lobed. Stamens 4, in pairs; anthers 2-celled, the connective prominent at the back, sometimes cristate and usually produced into one or two linear appendages adnate at the base or in their whole length to the back of the cells, most frequently one of them rarely both free at the end or in a great part of their length, sometimes produced beyond the cell and tipped with a crest or tuft of short points or hairs, but sometimes both appendages very short or obsolete, the anther-cells themselves usually tipped by short points, not crested, and distinct from, although sometimes mistaken for, the ends of the connective-appendages. Style shortly bifid at the end. Nuts reticulate-rugose, attached either obliquely at the base or adnate higher up. Seeds albuminous.—Shrubs or undershrubs studded with resinous glands and usually strongly scented. Leaves opposite. Flowers solitary in the axils of the stem-leaves, or opposite in terminal racemes, the floral leaves reduced more or less to deciduous bracts. Pedicels with a pair of bracts usually close under the calyx.

The genus is limited to Australia, the greater number of the species are extratropical and two only are natives of West Australia.

SECT. I. **Euprostanthera**.—Corolla-throat short and broad, upper lip short, very broad, erect, lower lip much longer with a large spreading middle lobe. Calyx usually closed over the fruit.

SERIES 1. **Racemosa**.—Flowers in terminal racemes, the floral ones all or mostly reduced to membranous or broad acuminate or very deciduous bracts.

Leaves mostly above 1 in. long, on rather long petioles, flat or nearly so.

One anther-appendage much longer than the cell. Corolla pubescent.

Leaves mostly oblong-lanceolate. Bracts narrow . . . . . 1. *P. lasianthos*.

Leaves mostly ovate. Bracts broad . . . . . 2. *P. prunelloides*.

Anther-appendages both shorter than the cell. Leaves ovate.

Leaves rather thick, usually entire. Corolla glabrous . . . . . 3. *P. cerulea*.

Leaves rather thin, coarsely toothed. Corolla pubescent . . . . . 5. *P. melissifolia*.

Leaves mostly  $\frac{1}{2}$  in. long or smaller, on rather long petioles, flat or nearly so. Anther-appendages shorter than the cells.

Leaves mostly about  $\frac{1}{2}$  in. long, orbicular ovate or oblong.

Leaves rather thick, mostly entire . . . . . 4. *P. ovalifolia*.

Leaves rather thin, mostly toothed.

Lower calyx-lip longer and narrower than the upper one . . . . . 6. *P. incisa*.

Both calyx-lips broad and nearly equal . . . . . 7. *P. Sieberi*.

Leaves much under  $\frac{1}{2}$  in. long, broadly ovate or orbicular.

Leaves mostly 2 to 4 lines long, rather thick, entire or slightly crenate, flat. Plant slightly hoary . . . . . 8. *P. rotundifolia*.



- Leaves mostly 1 to 2 lines long, not so thick, crenate, with slightly revolute margins. Plant pubescent or hirsute . . . 9. *P. violacea*.
- Leaves on short petioles, with revolute margins.
- Leaves mostly under  $\frac{1}{2}$  in., ovate, crenate, very rugose. Plant hirsute. Anther-appendages shorter than the cells . . . 10. *P. incana*.
- Leaves  $\frac{1}{2}$  to 1 in., ovate lanceolate or linear, entire, scarcely rugose. Plant hirsute. Both anther-appendages shortly exceeding the cells . . . 11. *P. hirtula*.
- Leaves from  $\frac{1}{2}$  in. and ovate to 1 in. and linear entire, sometimes echinate. Plant pubescent or nearly glabrous. One anther-appendage exceeding the cell . . . 12. *P. denticulata*.
- SERIES 2. *Convexæ*.**—*Leaves small or narrow, sessile or shortly petiolate, convex or with revolute margins when dry (nearly flat in P. cuneata). Flowers axillary, the floral leaves similar to the stem-ones or rather smaller.*
- Leaves obovate ovate or orbicular, mostly under  $\frac{1}{4}$  in. long.
- Pubescent-hirsute. Leaves ovate.
- Leaves very rugose, crenate. Anther-appendage not exceeding the cell . . . 13. *P. rugosa*.
- Leaves not rugose, entire. Anther-appendage half as long again as the cell . . . 14. *P. marifolia*.
- Slightly pubescent. Leaves orbicular or rhomboidal. Anther-appendage not exceeding the cell . . . 15. *P. rhombea*.
- Branches pubescent. Margins of the leaves very slightly recurved. Anther-appendage twice as long as the cell.
- Spinescent with opposite slender spines of  $\frac{1}{2}$  in. Leaves ovate often complicate and recurved . . . 16. *P. spinosa*.
- Unarmed. Leaves obovate or cuneate, nearly flat . . . 17. *P. cuneata*.
- Leaves linear,  $\frac{1}{4}$  to 1 in. long.
- Calyx glabrous inside or nearly so. Anther-appendage twice as long as the cell. Plant glabrous or nearly so . . . 18. *P. linearis*.
- Calyx with a raised transverse pubescent line inside at the base of the upper lip. Anther-appendage short or none.
- Glabrous or nearly so. Leaves smooth, mostly  $\frac{1}{2}$  in. or more. Anther-appendage nearly as long as the cell . . . 19. *P. phyllicifolia*.
- Pubescent or hirsute. Leaves about  $\frac{1}{4}$  in. long, scabrous, decussate. Anther-appendage nearly as long as the cell . . . 20. *P. decussata*.
- Glabrous or nearly so. Leaves smooth, about  $\frac{1}{2}$  in. long. Anther-appendage quite obsolete . . . 21. *P. empetrifolia*.
- SERIES 3. *Subconcavæ*.**—*Leaves (small or narrow), sessile or very shortly petiolate, concave, or with incurved margins or flat, the margins never recurved. Flowers axillary, the floral leaves similar to the stem ones. Anther-appendage about twice as long as the cell.*
- Leaves narrow, quite entire (above  $\frac{1}{4}$  in.). Plant glabrous or hoary with white appressed hairs.
- Leaves oblong-linear or lanceolate, mostly  $\frac{1}{2}$  to 1 in. long.
- Branches white.
- Calyx lips nearly equal . . . 22. *P. lithospermoides*.
- Calyx upper lip much longer than the lower one . . . 23. *P. Behriana*.
- Leaves linear-terete, channelled above. Western species.
- Calyx upper lip much larger than the lower . . . 24. *P. Baxteri*.
- Calyx-lips nearly equal . . . 25. *P. canaliculata*.
- Leaves very narrow-linear and nearly 1 in. long, or linear-oblong and much shorter. Eastern species.
- Calyx upper lip large and membranous, lower much smaller.
- Leaves mostly very narrow.
- Calyx upper lip broad, under 5 lines long . . . 26. *P. nivea*.
- Calyx upper lip ovate,  $\frac{1}{2}$  in. long . . . 27. *P. striatiflora*.
- Calyx-lips small, nearly equal. Leaves mostly linear-oblong . . . 28. *P. saxicola*.



*Centropetalus*



Leaves entire or toothed, usually small and narrow. Plant more or less glandular-pubescent or viscid.

Calyx upper lip larger than the lower. Plant very viscid-pubescent. Leaves mostly about 3 lines long.

Leaves entire . . . . . 29. *P. odoratissima*.

Leaves prominently toothed or pinnatifid . . . . . 30. *P. euphrasioides*.

Calyx-lips nearly equal. Plant slightly viscid-pubescent.

Leaves about 2 lines, entire or slightly toothed . . . . . 31. *P. cryptandroides*.

Leaves under 2 lines long, ovate or oblong. Plant nearly glabrous.

Calyx-lips nearly equal . . . . . 32. *P. eurybioides*.

SECT. II. **Klanderia**.—Corolla tube incurved, dilated upwards, the upper lip erect and concave, the lower lip spreading, shorter or not longer. Calyx-lips usually equally open. Anther-appendage small or none.

Leaves petiolate, flat, rather thick, above  $\frac{1}{4}$  in. and often  $\frac{1}{2}$  in. long. Corolla twice as long as the calyx.

Leaves orbicular . . . . . 33. *P. ringens*.

Leaves oblong or scarcely obovate . . . . . 34. *P. Leichhardtii*.

Leaves scarcely petiolate, small, the margins recurved.

Pedicels very short. Corolla not half as long again as the large calyx . . . . . 35. *P. calycina*.

Pedicels longer than the calyx. Corolla twice as long as the calyx . . . . . 36. *P. chlorantha*.

Leaves under 2 lines long, oblong, recurved, thick, the margins not recurved . . . . . 37. *P. microphylla*.

Leaves linear-terete, with incurved margins, 1 to 4 lines long . 38. *P. aspalathoides*.

SECT. 1. **EUPROSTANTHERA**.—Calyx with a distinctly striate tube, the upper lip after flowering usually slightly turned back, the lower lip turned up against it, closing the orifice of the tube. Corolla with the tube very shortly narrow at the base, the throat very broadly campanulate and oblique, the upper lip short, broad, erect, emarginate or broadly 2-lobed, the lower lip larger, with 3 broad spreading lobes, the middle one larger, notched or 2-lobed. Stamens usually concealed in the tube (short or incurved) or not very prominent.

The corolla in this section, although varying in size and in a slight degree in the proportion of the lobes, appears, as far as can be judged from dried specimens, remarkably uniform in general shape. The degree of development of the anther-appendages, although generally constant in species, does not appear to agree with other characters sufficiently to be available for subsectional groups.

SERIES 1. **RACEMOSÆ**.—Flowers in terminal racemes, the floral leaves, or at least the upper ones reduced to bracts, either small and membranous, or ovate and acuminate and very different from the stem-leaves, or in most cases so deciduous as to be rarely observable when the plant is in flower.

1. **P. lasianthos**, *Labill. Pl. Nov. Holl.* ii. 18, t. 157. A tall shrub, sometimes attaining the dimensions of a moderate sized tree, glabrous except the flowers. Leaves petiolate, usually oblong-lanceolate, rather acute, serrate, flat or the margins recurved, of a firm consistence, not rugose, dark green above, pale or glaucous and minutely dotted underneath, 2 to 3 in. long; in some Victorian specimens shorter broader more entire and almost coriaceous. Flowers opposite in pairs,

in short leafless racemes, forming a terminal panicle often leafy at the base, but the leaves under the upper racemes very much reduced and those under the pairs of flowers entirely abortive. Pedicels short. Bracts linear, shorter than the calyx and sometimes very minute. Calyx slightly pubescent, attaining 3 lines when in fruit, the tube obscurely striate, the upper lip broad, the lower rather smaller. Corolla "white tinged or spotted with pink" or "pale blue" hairy inside and out, often  $\frac{1}{2}$  in. long, the lobes very broad. Anthers with the longer appendage about twice as long as the cell, the other short and adnate. —Br. Prod. 508; Benth. in DC. Prod. xii. 559; Hook. f. Fl. Tasm. i. 283; Andr. Bot. Rep. t. 641; Bot. Reg. t. 143; Bot. Mag. t. 2434.

**N. S. Wales.**—Blue Mountains, *R. Brown* and others; New England, *C. Stuart*; southward to Illawarra, *Shepherd*, and Twofold Bay, *Mossman*, *F. Mueller*, and others.

**Victoria.**—Banks of streams, &c., near Melbourne, *Adamson*; Dandenong ranges, Mount Disappointment, and various parts of Gipps Land, *F. Mueller*.

**Tasmania.**—Derwent river and Port Dalrymple, *R. Brown*; common by the margins of forests, banks of streams, &c., *J. D. Hooker*.

Var. *subcoriacea*, *F. Muell.*, leaves smaller and firmer, flowers rather smaller.—Gram-pians, *Wilhelmi*.

2. ***P. prunelloides***, *R. Br. Prod.* 508. A tall shrub, quite glabrous except the flowers or minutely scaly-pubescent, the angles of the branches often prominent, and sometimes crisped or denticulate. Leaves on rather long petioles, ovate, obtuse, entire or with a few coarse irregular teeth, of the firm consistence of those of *P. lasianthos*, 1 to 2 in. long. Flowers in simple terminal racemes, or with one pair of branches at the base. Floral leaves reduced to broad membranous obtuse concave ciliate bracts, about as long as the calyx, and enclosing it in the young bud, but falling off long before the flowering. Pedicels short, with a pair of very deciduous linear-lanceolate bracts under the calyx. Calyx and corolla of *P. lasianthos*, or the latter rather less hairy. Anthers with one appendage about twice as long as the cell, the other very short or obsolete.—Benth. in DC. Prod. xii. 559.

**N. S. Wales.** Blue Mountains, *R. Brown*, *A. Cunningham* and others.

3. ***P. cœrulea***, *R. Br. Prod.* 508. A tall shrub, glabrous or minutely scaly-pubescent, intermediate in foliage between *P. lasianthos* and *P. prunelloides*, differing from both in the glabrous corolla and short anther-appendages, the angles of the branches sometimes prominent. Leaves petiolate, in the typical form ovate-lanceolate or lanceolate, slightly serrate, 1 to 2 in. long, and much like those of *P. lasianthos*, in the more northern specimens nearer to those of *P. prunelloides*. Flowers in simple terminal racemes or with one pair of branches at the base, the floral leaves reduced to ovate concave acuminate membranous bracts, falling off from the very young bud. Bracts under the calyx very small or obsolete. Calyx of *P. lasianthos*; corolla rather smaller than in that species, "blue" and quite glabrous. Anthers with one appendage very shortly free at the end, and about as long as the cell, the other much shorter and adnate.—Benth. in DC. Prod. xii. 559.

**N. S. Wales.** Grose river, *R. Brown*; shaded ravines, Wollondelly river. *A. Cunningham*, (both with narrow leaves); New England, *C. Stuart* with the ovate leaves of *P. prunelloides*.

4. ***P. ovalifolia***, *R. Br. Prod.* 509. A densely bushy strong-scented shrub, more or less hoary with a minute appressed pubescence. Leaves petiolate, ovate to oblong, obtuse, entire, rather thick and flat, rarely exceeding  $\frac{1}{2}$  in. and mostly smaller. Flowers rather small, in short loose terminal racemes, the floral leaves small, bract-like and deciduous, or the lower pair more leaf-like. Calyx not above 2 lines long, the lips nearly equal and both entire. Corolla "purple," about 4 or 5 lines long, slightly pubescent outside. Anthers with both appendages adnate nearly to the end, and not projecting beyond the cells. —*P. atriplicifolia*, *A. Cunn. in Benth. Lab.* 451, and in *DC. Prod.* xii. 560.

**Queensland.** Shoal bay passage, *R. Brown*; Wide Bay, *Bidwill*.

**N. S. Wales.** Mount Lindsay, *W. Hill*; barren hills S.W. of Lachlan river, *A. Cunningham*. Some specimens from Mudgee, *Woolfs*, belong also probably to this species, unless indeed they represent an entire-leaved variety of *P. incisa*.

Var. ? *latifolia*. Leaves broadly ovate or almost orbicular and occasionally with one or two slight crenatures, very much larger than in *P. rotundifolia*, and as much smaller than in *P. cærulea*—*P. ovalifolia*, *Benth. in DC. Prod.* xii. 560.—N.W. interior of N. S. Wales, *Fraser*; head of Hastings river, *C. Moore*.

5. ***P. melissifolia***, *F. Muell. Fragm.* i. 19. A slender loosely branched shrub, with the habit and short hoary pubescence of *P. incisa* and *P. Sieberi*, of which it may be a variety as suggested by *F. Mueller*. Leaves much larger than in those species, usually ovate, 1 to  $1\frac{1}{2}$  or even 2 in. long, rather thin, coarsely toothed. Racemes longer and looser than in *P. incisa*, all leafless. Calyx-lobes rather larger than in that species, nearly equal, the upper one entire, the lower one emarginate or 2-lobed. Corolla about twice as long as the calyx. Anthers with the appendages adnate almost to the end and not exceeding the cells.

**Victoria.** Ranges near Cape Otway and Port Phillip, *F. Mueller*.

6. ***P. incisa***, *R. Br. Prod.* 509. A slender much branched shrub, quite glabrous or more frequently slightly hoary with a minute pubescence. Leaves from ovate-lanceolate to oblong, obtuse, usually bordered by a few coarse teeth, contracted into a rather long petiole, rather thick and flat in some specimens, thinner with the margins slightly recurved in others, green above, pale underneath, mostly  $\frac{1}{2}$  to 1 in. long. Flowers rather small, in short but slender terminal racemes, the lowest pair of floral leaves sometimes like the stem leaves but smaller, the others reduced to small bracts falling off before the flowering. Pedicels slender, but shorter than the calyx; bracts small. Calyx about 2 lines long or scarcely 3 lines when in fruit, the tube rather broad, striate, pubescent, the upper lip very broad, entire; the lower lip longer, narrower, obtuse, and usually emarginate. Corolla expanding to about 5 lines diameter, the lobes all broad. Anthers with both appendages adnate nearly or the shorter one quite to the end, and neither of them exceeding the cell.—*Benth. in DC. Prod.* xii. 559.

**N. S. Wales.** Grose river, *R. Brown*; Blue Mountains, *Caley*, *Miss Atkinson*; Avoca valley, Blue Mountains, *Wilhelmi*; Lansdown river and Port Macquarrie, *C. Moore*; Hastings river, *Beckler*.

There are two common forms of this species, arising perhaps from the degree of exposure of their stations, the one with rather thick less-toothed leaves seems almost to pass into *P. ovalifolia*, the other with thinner paler more cut leaves. Both are in Brown's herbarium, but chiefly the former. The comparative size and shape of the two calyx-lips appears to be variable.

Var. ? *pubescens*, *F. Mueller*. The whole plant very pubescent. Leaves more obovate or cuneate. Anthers with one appendage rather more prominent (in the only flower examined) the calyx and other characters those of the typical form. Possibly however a distinct species.—Forest rivulets near Twofold Bay, *F. Mueller*; Port Macquarrie, *C. Moore*.

7. **P. Sieberi**, *Benth. Lab. Gen. et Sp.* 451, and in *DC. Prod.* xii. 559. A tall slender much branched shrub, slightly pubescent and closely resembling the thin-leaved forms of *P. incisa*, and perhaps a variety. Leaves usually more deeply toothed and more contracted at the base, the racemes shorter and more leafy, and the calyx-lips both broad and very nearly equal.—*P. incisa*, *Sieb. Pl. Exs.* not of *R. Br.*

**N. S. Wales.** Port Jackson, *Sieber. n.* 189; shady woods on the coast from Port Jackson to the Illawarra, *A. Cunningham*. It remains to be ascertained how far the characters separating this from *P. incisa*, derived chiefly from the calyx, may prove constant.

8. **P. rotundifolia**, *R. Br. Prod.* 509. A tall very bushy shrub, attaining sometimes 6 or 7 ft., the branches very shortly hoary-pubescent, the foliage nearly glabrous. Leaves broadly ovate orbicular or spatulate, on rather long petioles, very obtuse, entire or with a few large crenatures, all under  $\frac{1}{2}$  in. long and often all under  $\frac{1}{4}$  in. Flowers in short close terminal racemes, the lower ones sometimes in the axils of leaves like the stem ones, but the upper floral leaves always reduced to small deciduous bracts. Pedicels shorter than the calyx, with linear deciduous bracts. Calyx about 2 lines long when in flower, somewhat enlarged afterwards, the tube striate, the lips broad and nearly equal. Corolla rather larger than in *P. ovalifolia*. Anthers with both appendages adnate nearly to the end, and not protruding beyond the cells.—*Benth.* in *DC. Prod.* xii. 560, *Hook. f. Fl. Tasm.* i. 284, t. 89; *P. retusa*, *R. Br. Prod.* 509; *Benth.* in *DC. Prod.* xii. 560; *P. cotinifolia*, *A. Cunn.* in *Benth. Lab. Gen. et Sp.* 452, and in *DC. Prod.* xii. 560.

**N. S. Wales.** Barren rocky country W. of Wellington valley, *A. Cunningham*; Lower Macquarrie river, *Bowman*.

**Victoria.** Buffalo Range, Bacchus Marsh, Mount Zero, Avon and Genoa rivers, *F. Mueller*; Mount Arepiles, *Dallachy*.

**Tasmania.** Port Dalrymple, *R. Brown*; abundant on N. and S. Esk rivers, *J. D. Hooker*.

**S. Australia.** S. E. part of the colony, *J. E. Woods*.

Brown's specimens of *P. retusa* differ from the typical *P. rotundifolia* but very slightly, in the leaves more constantly crenate.

9. **P. violacea**, *R. Br. Prod.* 509. A slender divaricately branched twiggly shrub, pubescent, with very short but rigid hairs. Leaves very small, shortly but distinctly petiolate, broadly ovate or orbicular, more or less crenate, with revolute margins, rarely exceeding 2 lines and often not above one line long. Flowers usually blueish purple, in 2 or 3 pairs,

forming little compact terminal racemes, the small bract-like floral leaves very deciduous. Calyx shortly pubescent,  $1\frac{1}{2}$  to 2 lines long, the tube striate, the upper lip very broad, the lower rather longer and narrower, both usually quite entire. Corolla not twice as long as the calyx, and sometimes scarcely exceeding it, the throat very broad. Anthers with both appendages adnate, one shortly free at the end, but shorter than the cell.—Benth. in DC. Prod. xii. 563; Bot. Reg. t. 1072; *P. retusa*, Sieb. Pl. Exs. not of R. Br.

**N. S. Wales.** Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, n. 199 and others.

Var. *albiflora*. Corolla white, but no other difference.—*P. thymifolia*, A. Cunn. in Benth. Lab. Gen. et Sp. 455, and in DC. Prod. xii. 563.—Springwood, Blue Mountains, growing with the typical form, *A. Cunningham*.

10. **P. incana**, *A. Cunn. in Benth. Lab. Gen. et Sp.* 455, and in DC. Prod. xii. 563. A handsome shrub of 5 or 6 ft., more densely hirsute and more robust in all its parts than *P. violacea* and *P. rugosa*, some varieties of which it sometimes resembles. Leaves on very short petioles, ovate, prominently crenate, bullate-rugose, with recurved margins, 4 to 6 lines long, the lower floral ones similar but smaller. Flowers small, in several pairs crowded together at the ends of the branches into short racemes leafy at the base, the upper floral leaves reduced to small very deciduous bracts. Pedicels short. Calyx hirsute, about 2 lines long, both the lips broad and entire, the lower one scarcely longer than the upper. Corolla scarcely twice as long as the calyx. Anthers with both appendages adnate, one shortly free, but shorter than the cell, the other still shorter.

**N. S. Wales.** Rocky ridges, Nepean river, *A. Cunningham*. Some imperfect specimens from Bent's river, *Woolls*, probably belong to the same species.

11. **P. hirtula**, *F. Muell.* A shrub of 3 to 5 ft., pubescent or hirsute with the rigid hairs of *P. marifolia*, to which this species is nearly allied, differing in inflorescence and in the larger leaves. Leaves very shortly petiolate, ovate-lanceolate oblong or almost linear, obtuse, entire, with revolute margins, usually hirsute above and whitish underneath, scarcely or not at all rugose, rarely under  $\frac{1}{2}$  in. and often nearly 1 inch long, the floral ones smaller, the upper ones reduced to small deciduous bracts. Flowers larger than in *P. marifolia*, in the upper axils, forming an interrupted terminal more or less leafy raceme, or sometimes nearly all axillary. Pedicels short; bracts small and setaceous. Calyx hirsute,  $2\frac{1}{2}$  to 3 lines long, both the lips broad and nearly equal, entire or the lower one retuse. Corolla nearly twice as long as the calyx, glabrous or slightly hairy. Anthers with both the appendages shortly exceeding the cells.

**Victoria.** Buffalo Range, Mount Disappointment, *F. Mueller*; Grampians, *Wilhelmi*.

Var. *angustifolia*. Leaves narrow and rather less hirsute.—Genoa Peak, *F. Mueller*.

12. **P. denticulata**, *R. Br. Prod.* 509. A robust shrub, with virgate or long and loose sometimes slender but rigid branches, pubescent



with short crisped hairs. Leaves sessile or nearly so, from  $\frac{1}{4}$  in. or under and broadly lanceolate to  $\frac{1}{2}$  in. long or more and narrow-linear, obtuse or almost acute, with recurved margins, not toothed but often bearing on the upper surface near the margin a few short rigid hairs on raised tubercles resembling minute prickles, all very spreading, the floral ones passing into ovate acuminate coloured bracts. Flowers usually in distant pairs, forming interrupted terminal racemes often leafy at the base. Pedicels short. Bracts narrow-linear, close under the calyx. Calyx more or less hirsute, 2 to 3 lines long, the lips broad, entire, nearly equal or the lower one rather smaller. Corolla glabrous or nearly so. Anthers with one appendage nearly half as long again as the cell, the other short and adnate.—Benth. in DC. Prod. xii. 561.

**N. S. Wales.** Port Jackson, *R. Brown*, *Woolfs*, and others; granitic ranges W. of Bathurst, *A. Cunningham*.

**Victoria.** Buffalo Range, Futter's Range, Bendigo, Grampians, *P. Mueller*; Wimmera, *Dallachy*.

The name is unfortunate as the leaves are not toothed, and it is only occasionally that the asperities on the upper surface give them a denticulate appearance. Most of the Port Jackson specimens have rather broad lanceolate leaves, *Cunningham's* have narrow and long linear leaves, *Brown's* are intermediate. The Victorian and a few of the Port Jackson specimens have the leaves mostly under  $\frac{1}{4}$  in., with few or none of the tubercular prickles. The species is remarkable for the acuminate bract-like floral leaves, and like *P. hirtula* forms almost a passage from the racemose to the axillary inflorescences.

**SERIES 2. CONVEXÆ.**—Leaves small or narrow, sessile or shortly petiolate, convex or with revolute margins at least when dry (in *P. cuneata* and *P. spinosa*, the margins usually flat but occasionally narrowly recurved). Flowers axillary, the floral leaves all similar to the stem ones or rather smaller, and the flowering branch usually growing out beyond the flowers.

13. ***P. rugosa***, *A. Cunn. in Benth. Lab. Gen. et Sp.* 456, and in *DC. Prod.* xii: 563. A robust divaricately-branched shrub, pubescent or hirsute with short rigid hairs. Leaves small, sessile or nearly so, ovate, crenate, with revolute margins, very rugose, from  $1\frac{1}{2}$  to 4 lines long, the floral ones all similar though sometimes smaller. Flowers small, not numerous, all axillary, scattered along the branches or rarely 2 or 3 pairs together near the ends. Pedicels very short, the bracts very small. Calyx not exceeding 2 lines, hispid, the upper lip broad, short, distinctly or obscurely 3-toothed, the lower lip longer, usually emarginate. Corolla not twice as long as the calyx. Anthers with both appendages adnate, one shortly free at the end but shorter than the cell, the other still shorter.

**N. S. Wales.** Mountainous country bordering on Hunter's River, *A. Cunningham*; Monkey Creek, *Woolfs*.

14. ***P. marifolia***, *R. Br. Prod.* 509. An undershrub with twiggy branches, pubescent or hirsute with short rigid hairs. Leaves sessile or very shortly petiolate, ovate or ovate-lanceolate, obtuse, entire, with revolute margins, scabrous-hispid above but not rugose, whitish under-

neath, 2 to 4 lines long. Flowers all axillary, but sometimes forming interrupted leafy racemes, the floral leaves all like those of the stem. Pedicels very short; bracts subulate. Calyx more or less hirsute, 2 to 2½ lines long, the lips broad, nearly equal and usually entire, often assuming a bluish tint. Corolla not twice as long as the calyx, glabrous or sparingly hirsute. Anthers with one appendage about half as long again as the cell, the other short and adnate.—Benth. in DC. Prod. xii. 562.

**N. S. Wales.** Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham*, *Woolfs* and others.

15. **P. rhombea**, *R. Br. Prod.* 509. A shrub or undershrub, with long divaricate almost terete branches more or less pubescent. Leaves nearly sessile, orbicular or almost rhomboidal, glabrous or sparingly ciliate, entire, with revolute margins and almost bullate, 2 to 3 lines diameter. Flowers small, in the upper axils, on very short pedicels. Calyx usually not 2 lines long, shortly pubescent and very glandular, the lips nearly equal, the upper one very broad, the lower one narrower. Corolla not twice as long as the calyx, glabrous. Anthers with the appendages adnate, the longer one very shortly free at the end but shorter than the cell, the other still shorter.—Benth. in DC. Prod. xii. 563.

**N. S. Wales.** Blue Mountains, *R. Brown*, *Woolfs*; Illawarra, *Shepherd*.

16. **P. spinosa**, *F. Muell. in Hook. Kew Journ.* viii. 168, in *Trans. Phil. Soc. Vict.* i. 48 and *Pl. Vict.* ii. t. 56. A rigid but slender divaricate shrub with hirsute branches and remarkable for the numerous small branchlets reduced to opposite divaricate spines, about ½ in. long, either leafless or with a pair of small leaflets at their base. Leaves very small, shortly petiolate, ovate, obtuse, entire, complicate and recurved, the margins usually slightly revolute, rarely above 2 lines long. Pedicels axillary, 4 to 8 lines long, with minute setaceous bracts above the middle. Calyx more or less hirsute, 2 to 3 lines long, the lips not very broad, entire and nearly equal. Corolla "lilac," slightly hairy outside, not twice as long as the calyx. Anthers with one appendage about twice as long as the cell, the other short and adnate.

**Victoria.** About springs and on irrigated rocks in the Grampians, *F. Mueller*, *Wilhelmi*; summit of Mount Arapiles (with very hirsute leaves), *Dallachy*.

**S. Australia.** Tattiarra country, *J. E. Woods*; scrub near Wallan's Hut and Cygnet Bay, Kangaroo Island, *Waterhouse*.

17. **P. cuneata**, *Benth. in DC. Prod.* xii. 560. A much branched spreading shrub of 2 or 3 ft., more or less pubescent or villous with short crisped hairs. Leaves sessile or nearly so, often crowded on the short branchlets, obovate-cuneate or almost orbicular, obtuse, entire or crenate at the end, flat or recurved and complicate, the margins often slightly revolute, rather thick, glabrous or pubescent, mostly about 2 lines, rarely above 3 lines long, the floral ones scarcely smaller. Flowers all axillary, but sometimes crowded into terminal leafy racemes.

Pedicels very short. Bracts linear, ciliate, often as long as the calyx-tube. Calyx  $2\frac{1}{2}$  to 3 lines long or even longer when in fruit, the tube prominently striate, the lips nearly equal, at least as long as the tube, broad and entire, or the lower one emarginate. Corolla white with purple spots, nearly glabrous, twice as long as the calyx. Anthers with one appendage about twice as long as the cell, the other short and adnate.—Hook. f. Fl. Tasm. i. 284. t. 90.

**Victoria.** Summit of many of the Australian Alps, Haidinger and Munyong ranges, Mount Kosciusko and others, at an elevation of 4000 to 7000 ft., *F. Mueller*.

**Tasmania.** Sterile gravelly soil on the S. Esk river, abundant, *Gunn*, *Archer* and others.

18. ***P. linearis***, *R. Br. Prod.* 509. A tall erect shrub, glabrous or slightly pubescent. Leaves nearly sessile, linear, obtuse, entire, the margins more or less revolute in drying,  $\frac{1}{2}$  to above 1 in. long, the upper floral ones similar but smaller. Flowers all axillary, but the upper ones sometimes forming terminal interrupted leafy racemes. Pedicels short. Bracts small, filiform. Calyx glabrous or slightly pubescent, about 2 lines long or longer when in fruit, the lips not very broad, nearly equal, entire, without any or only a very slight trace of the transverse downy line of the three following species. Corolla sprinkled with a few hairs or hairy all over, about twice as long as the calyx. Stamens longer than in most species of this section, and the anther-cells more divergent; the longest appendage nearly twice as long as the cell, the other short and adnate.—Benth. in DC. Prod. xii. 561.

**N. S. Wales.** Port Jackson to the Blue Mountains, *R. Brown*, *A. Cunningham* and others.

19. ***P. phyllifolia***, *F. Muell. Fragm.* i. 19. A robust bushy shrub sometimes small but attaining often several ft., glabrous or hoary-pubescent with very short somewhat crisped hairs. Leaves sessile or nearly so, oblong-linear, obtuse, entire, with revolute margins, usually thicker and broader than in *P. linearis*, in some specimens all under  $\frac{1}{2}$  in., in others  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long. Flowers all axillary. Pedicels shorter than the calyx, with linear-setaceous bracts close under the calyx, or at some distance from it. Calyx 2 to  $2\frac{1}{2}$  or rarely 3 lines long, the tube prominently striate, the lips ovate, the upper one with a transverse rather broad cottony line inside at the base, the lower one at first nearly equal to, at length much smaller than, the upper one. Corolla "whitish," glabrous or very sparingly pubescent, nearly twice as long as the calyx. Anther-appendages short and adnate or one of them with a small point not cristate and scarcely exceeding the cell.

**Queensland.** Glass-houses, *F. Mueller*, a single specimen in the Hookerian herbarium.

**N. S. Wales.** New England, *C. Moore*.

**Victoria.** Mount M'Farlane, Mitta-Mitta mountains, rocks at Maneroo, *F. Mueller*.

20. ***P. decussata***, *F. Muell. Fragm.* i. 126. A robust shrub of few feet, with numerous short leafy branches, pubescent or hirsute with crisped or spreading hairs. Leaves sessile or nearly so, crowded and

decussate on the smaller branches but not clustered in the axils, linear, obtuse, with revolute margins, somewhat coriaceous, scabrous-hirsute with minute almost prickle-like hairs like those of *P. denticulata*, mostly about  $\frac{1}{2}$  in. long. Flowers all axillary, on very short pedicels. Bracts linear, half as long as the calyx. Calyx short and broad, strongly ribbed, glandular-hirsute, scarcely above 2 lines long when in fruit, the lips nearly orbicular and equal, with a transverse downy curved line inside at the base of the upper one. Corolla shortly exceeding the calyx (perhaps not fully developed), glabrous or nearly so. Anther-appendages adnate, the longer one very shortly free at the end, and not at all or scarcely exceeding the cell.

**Victoria.** Rocky summits of the M'Alister range and Mount Mueller, *F. Mueller*.

21. ***P. empetrifolia***, *Sieb. in Spreng. Syst. Cur. Post.* 226. An erect much branched but rather slender shrub, glabrous or sprinkled with a few short appressed hairs. Leaves sessile, linear, acute, entire, with revolute margins, rarely above  $\frac{1}{2}$  in. long. Flowers all axillary. Pedicels short, with a pair of linear bracts close under the calyx. Calyx about 2 lines long, the tube prominently striate, the lips broad and about equal, the upper one with a prominent transverse downy line inside at the base, the lower one often emarginate. Corolla fully twice as long as the calyx. Anthers with the connective prominent at the back, but without any or only very rudimentary appendages. Upper lobe of the style short.—*Chilodia scutellarioides*, *R. Br. Prod.* 507; *Benth. in DC. Prod.* xii, 558; *Bot. Mag. t.* 3405.

**N. S. Wales.** Port Jackson to the Blue Mountains, *R. Brown, Sieber, n.* 187 and many others.

The genus *Chilodia* was founded mainly upon the absence of the anther-appendages, the degree of development of which is very different in different species of *Prostanthera*; they are quite obsolete also in some species of the section *Klanderia*, and scarcely distinguishable in some other *Prostantheræ*, where they are completely adnate to the back cell. The second character, the transverse rib inside the calyx, appears to be no more than the transverse pubescent zone of the two preceding species, rather narrower and more raised in this one, but quite disconnected with the venation of the calyx.

**SERIES 3. SUBCONCAVÆ.**—Leaves (small or narrow) sessile or very shortly petiolate, concave or with incurved margins or flat, the margins never recurved. Flowers all axillary, the floral leaves similar to the stem-ones. Anthers with one appendage about twice as long as the cell.

The species of this group in most cases appear to pass into each other so as to make it very difficult to draw any definite lines between them when the specimens are numerous.

22. ***P. lithospermoides***, *F. Muell. Fragm.* vi. 107. A shrub of 6 to 8 ft., hoary with appressed hairs, the young shoots silky. Leaves very shortly petiolate or nearly sessile, oblong-lanceolate or almost linear, obtuse or acute, entire, flat or concave, the margins not recurved, the larger ones 1 to 2 in. long, the floral ones smaller but similar. Flowers axillary, on very short pedicels. Bracts nearly as long as the

calyx. Calyx silky-pubescent, about  $2\frac{1}{2}$  lines long, the lips nearly equal, entire or sinuate-toothed. Corolla white (*F. Mueller*) or blue (*O'Shanesy*), softly pubescent, not twice as long as the calyx. Anthers with one appendage about twice as long as the cell, the other short and adnate.

**Queensland.** Table Mount, Rockhampton, *O'Shanesy*; Armadilla, *Barton*.

23. **P. Behriana**, *Schlecht. in Linnaea*, xx. 610. A shrub of 5 or 6 ft. with erect branches, hoary or white with short closely appressed hairs. Leaves sessile, linear or oblong, mostly obtuse, entire, thick, flat or concave, the margins never recurved, often above 1 in. long when narrow, much shorter when broad, or in some specimens the narrow ones also under  $\frac{1}{2}$  in. Flowers axillary, sessile or very shortly pedicellate, the linear bracts very deciduous. Calyx pubescent or villous, about 4 lines long, the tube sulcate-striate, the upper lip erect, entire, about as long as the tube, the lower lip scarcely half so long, entire or notched. Corolla "white," villous outside, twice as long as the calyx. Anthers with one appendage about twice as long as the cell, the other short and adnate.—*Benth. in DC. Prod.* xii. 700.

**S. Australia.** Rocky valley of the Tonunda, *Behr.*; Murray river, *F. Mueller*; near Adelaide, *Blandowski*.

24. **P. Baxteri**, *A. Cunn. in Benth. Lab.* 452, and in *DC. Prod.* xii. 561. An erect heath-like shrub of 1 to 3 or 4 ft., the branches white with a close appressed tomentum. Leaves sessile, linear-terete, obtuse, entire, with involute margins, slender and mostly about  $\frac{1}{2}$  in. long in the typical form, or rarely nearly  $\frac{3}{4}$  in., quite glabrous. Flowers all axillary, on very short pedicels, with setaceous bracts. Calyx when in flower 2 to  $2\frac{1}{2}$  lines long, often 4 lines when in fruit, more or less hoary or white with appressed hairs or rarely glabrous, the tube striate, the upper lip large and often shortly and obtusely acuminate, the lower one much smaller. Corolla pubescent, not twice as long as the calyx. Anthers with one appendage nearly twice as long as the cell, the other short and adnate.

**W. Australia.** King George's Sound or to the eastward, *Baxter*; Thomas river, *Maxwell*.

*Var. crassifolia.* Leaves under  $\frac{1}{2}$  in. long, thicker and broader than in the type.—Phillips river and Eyres Range, *Maxwell*.

25. **P. canaliculata**, *F. Muell. Fragm.* vi. 105. An erect heath-like shrub of 1 to 2 ft., the branches hoary with minute appressed hairs or nearly glabrous. Leaves sessile or nearly so, linear-terete, obtuse, entire, with involute margins, under  $\frac{1}{2}$  in. and often scarcely  $\frac{1}{4}$  in. long. Flowers all axillary, on short pedicels, the bracts apparently wanting. Calyx about two lines long, prominently striate, glabrous, the lips shorter than the tube and nearly equal. Corolla about twice as long as the calyx, more or less hairy or nearly glabrous. Anthers with one appendage about twice as long as the cell, the other short and adnate.

**W. Australia.** Kalgan river, *Oldfield*, *F. Mueller*; towards Cape Riche, *Drummond*, 4th coll. n. 166, 5th coll. n. 343; Fitzgerald river, *Maxwell*.

The species is near *P. Baxteri*, but readily distinguished by the calyx, very near also to the eastern *P. saxicola*, but the leaves much narrower.

Var. ? *canosericea*. Leaves small, rather flatter, and sometimes distinctly petiolate, silvery-white on both sides, with the same tomentum as the branches.—*Drummond, 4th coll. n. 164.*

26. *P. nivea*, *A. Cunn. in Benth. Lab. Gen. et Sp.* 452, and in *DC. Prod.* xii. 561. A beautiful shrub of 3 to 6 ft., glabrous except the corolla or sprinkled with a few appressed hairs, especially on the young shoots, and usually of a pale green. Leaves sessile, linear-terete with incurved or involute margins, or flat when fresh, acute or obtuse, rather slender, mostly  $\frac{1}{2}$  to 1 in. long, the upper floral ones smaller. Flowers rather large, of a snow white or tinged with pale blue, all axillary, the upper ones forming interrupted leafy racemes. Pedicels much shorter than the calyx, with short setaceous bracts. Calyx  $2\frac{1}{2}$  to 3 lines long when in flower and not much enlarged afterwards, slightly pubescent, the tube prominently ribbed, the lips broad and ciliate, the upper one much larger than the lower. Corolla pubescent or villous, twice as long as the calyx. Anthers with one appendage about twice as long as the cell, the other short and adnate.—*Bot. Mag. t. 5658.*

**N. S. Wales.** Barren rocky hills on the Lachlan river, *A. Cunningham*; Castlereagh river, *C. Moore*; New England, *C. Stuart*.

**Victoria.** Mountains of Bacchus Marsh, Mount Korong, Mount Hope, Station Peak, &c., *F. Mueller*.

Var. *induta*. Branches and foliage hoary or white with appressed hairs, the young shoots silky. Flowers rather larger.—Castlereagh river, *C. Moore*.

27. *P. striatiflora*, *F. Muell. in Linnæa*, xxv. 425. A rigid much branched shrub, sometimes quite low, sometimes attaining 5 or 6 ft., glabrous or the young shoots hoary or silky with short appressed hairs, the smaller branches sometimes almost spinescent. Leaves sessile or nearly so, oblong-lanceolate or linear, mostly obtuse, entire, flat or with incurved margins, rather thick, usually under  $\frac{1}{2}$  in. long, but when narrow often  $\frac{3}{4}$  in., the floral ones gradually smaller, the upper ones shorter than the calyx. Flowers all axillary, but the upper ones crowded into terminal leafy racemes or spikes. Pedicels very short. Calyx-tube not 2 lines long, prominently striate, the upper lip ovate, obtuse, often  $\frac{1}{2}$  in. long when in fruit, the lower lip not half so large. Corolla nearly twice as long as the calyx, glabrous or sprinkled with a few hairs, white streaked with red and tinged with yellow at the base of the broad middle lobe of the lower lip. Anthers with one appendage about twice as long as the cell, the other short and adnate.

**Queensland.** Newcastle range, *Sutherland*.

**N. S. Wales.** From the Lachlan and Darling to the Barrier Range, *Victorian and other Expeditions*.

**S. Australia.** Cudnaka, Arkaba, and Lake Torrens, *F. Mueller*; towards Cooper's Creek, *Wheeler*; Lake Gillies, *Burkitt* (a short-leaved form, and another with narrow white or hoary leaves), Mount Morphett, *M'Douall Stuart's Expedition*.

The species is very nearly allied to *P. nivea*, and sometimes difficult to distinguish from it. In general it has shorter broader leaves, a more dense inflorescence, the upper lobe of the calyx longer and not so broad, and the corolla more glabrous.

Var. ? *sericea*. The whole plant white with soft silky hairs. Leaves rather short and broad.—Gawler ranges, S. Australia, *Mrs. Sullivan*; a small fragment in Herb. F. Mueller, under the name of *P. Sullivaniae*, but quite insufficient to judge whether it be any more than a variety of *P. striatiflora*, corresponding with the white silky varieties of *P. canaliculata* and others of this series.

28. **P. saxicola**, *R. Br. Prod.* 509. A slender shrub or undershrub, sometimes having the appearance of a rigid annual; the stems much branched at the base and ascending to from 6 in. to 1 ft. in the typical form, more erect and attaining 2 ft. in others, hoary with minute appressed hairs or nearly glabrous. Leaves very shortly petiolate or nearly sessile, oblong or linear-oblong, obtuse, entire, flat, rather thick, 2 to 4 lines long in the typical form, the young ones sprinkled with appressed hairs, the older ones usually glabrous. Flowers small, in few pairs in the upper axils. Pedicels short, with setaceous bracts. Calyx about 2 lines long, more or less hispid with spreading hairs especially in the small typical specimens, the lips nearly equal. Corolla nearly twice as long as the calyx, glabrous or slightly pubescent. Anthers with one appendage about twice as long as the cell, the other short and adnate.

**N. S. Wales.** George's river, *R. Brown* (the specimens all under 1 ft. and the calyx very hispid).

Var. *major*. Taller, more shrubby, leaves longer and narrower, calyx less hispid and sometimes almost glabrous.—*P. saxicola*, *A. Cunn.*; Benth. in *DC. Prod.* xii. 562; *P. pimeleoides*, *F. Muell. Fragm.* vi. 107.—Rocky ranges near Bathurst, *A. Cunningham*; New England, *C. Stuart*.

29. **P. odoratissima**, *Benth. in Mitch. Trop. Austr.* 291, and in *DC. Prod.* xii. 700. A small erect bushy shrub or undershrub, more or less pubescent with glandular hairs, the branches and foliage apparently viscid and very strongly scented. Leaves sessile and often clustered in the axils, linear or almost lanceolate, obtuse, entire, thick, flat or concave, the margins never recurved, mostly about  $\frac{1}{4}$  in. long. Flowers axillary, on short pedicels, the bracts linear, obtuse, thick and often as long as the calyx. Calyx  $2\frac{1}{2}$  lines or at length 3 lines long, rather narrow, prominently striate, the lips ovate, the upper one considerably longer than the lower. Corolla not seen perfectly open, glabrous outside when in bud. Anthers with one appendage about twice as long as the cell, the other short and adnate.

**Queensland.** Mantuan Downs, *Mitchell*.

30. **P. euphrasioides**, *Benth. in Mitch. Trop. Austr.* 360, and in *DC. Prod.* xii. 700. A small bushy shrub, villous with white spreading hairs intermixed with glandular ones and often viscid. Leaves on very short petioles or almost sessile, often clustered in the axils, linear-oblong, obtuse, with 2 or 3 prominent obtuse teeth on each side or almost pinnatifid, mostly about 3 lines long, rather thick, flat, the margins never recurved. Flowers all axillary, rather large. Pedicels short but slender. Bracts linear, obtuse, rather long. Calyx pubescent or hirsute, about 3 lines or at length sometimes 4 lines long, the

lips entire, broad, the upper one usually larger than the lower. Corolla more than twice as long as the calyx, nearly glabrous outside, hairy inside. Anthers with one appendage about twice as long as the cell, the other short and adnate.

**Queensland.** On the Maranoa, *Mitchell*; Hodgson's Creek and Dogwood Creek, *Leichhardt*; Cape river and Broad Sound, *Bourman*.

**31. *P. cryptandroides*, A. Cunn. in Benth. Lab. Gen. et Sp. 453, and in DC. Prod. xii. 561.** A heath-like shrub, with slender virgate branches, glabrous or slightly glandular-pubescent and viscid. Leaves sessile or very shortly petiolate and sometimes clustered in the axils, linear or linear-lanceolate, obtuse, entire or with 2 or 3 short obtuse teeth on each side, flat or concave, the margins not recurved, 2 to 3 lines long. Flowers all axillary, on very short pedicels. Bracts close under the calyx, linear-lanceolate and almost as long as the calyx. Calyx about 2 lines long, slightly hairy, prominently ribbed but rather thin, the lips ovate, obtuse, nearly equal. Corolla glabrous outside, not twice as long as the calyx. Anthers with one appendage about twice as long as the cell, the other short and adnate.

**N. S. Wales.** Sandstone Hills, N.W. branch of Hunter's river, *A. Cunningham*. Nearly allied to *P. euphrasioides*, although the slender stems, small leaves, &c., give it a very different aspect.

**32. *P. eurybioides*, F. Muell. in Hook. Kew Journ. viii. 168, and in Trans. Phil. Soc. Vict. i. 48.** A shrub with slightly hoary-pubescent branches. Leaves small, sessile, often clustered in the axils, from ovate to oblong-linear, obtuse, entire, thick, concave, usually glabrous, 1 to 2 lines long, the floral ones similar or passing into broader bracts. Flowers axillary, but usually 3 or 4 pairs crowded at the ends of the branches so as to form short leafy racemes, the floral leaves shorter than the calyx. Pedicels short; bracts short and obtuse. Calyx nearly 3 lines long, coloured, glabrous or nearly so, prominently ribbed, the lips nearly equal, the lower one sometimes retuse. Corolla glabrous, more than twice as long as the calyx. Anthers with one appendage about twice as long as the cell, the other short and adnate.

**S. Australia.** Mallee scrub, near Mount Barker, *F. Mueller*.

The specimens are few and small, and the habit may be different when more fully developed. The affinities of the species appear, however, to be rather with the present series than with the *Racemosæ*.

**SECT. 2. KLANDERIA.**—Calyx with the tube less prominently striate than in *Euprostanthera*, the lips nearly equal, and usually equally open after flowering. Corolla-tube narrow at the base, usually incurved and dilated upwards, the upper lip erect concave or arched, the lower lip shorter or at any rate not longer and spreading. Anther-appendages very short and adnate or quite obsolete, or rarely one very delicate one about as long as the cell.

The shape of the corolla is so different from that which is so nearly uniform in *Euprostanthera*, that this section might well be considered as a distinct genus, were it not



that in other respects some species come so near to different typical species of *Prostanthera*, as to prevent their having any distinguishing habit. As a sectional name I have preferred F. Mueller's generic name *Klanderia*, to that of *Cryptia* previously established by Brown, the latter being derived from a character probably abnormal in the particular flower examined.

33. **P. ringens**, *Benth. in Mitch. Trop. Austr.* 363, and in *DC. Prod.* xii. 700. A much branched shrub, glabrous or the branches slightly pubescent. Leaves on rather long petioles, broadly ovate or orbicular, obtuse, entire, rather thick, flat, under  $\frac{1}{2}$  in. diameter. Flowers all axillary, on very short pedicels. Calyx glabrous, herbaceous, scarcely striate, fully 3 lines long, the lips broad, equal, entire, not half so long as the tube. Corolla-tube shortly exserted, the upper lip concave, 2-lobed, longer than the lower one. Stamens nearly as long as the corolla; anthers without any prominent appendages to the connective.

**Queensland.** On the Maranoa, *Mitchell*. The leaves resemble those of the larger varieties of *P. rotundifolia*, but are larger and entire, the flowers are totally different.

34. **P. Leichhardtii**, *Benth.* A bushy shrub, the branches slightly pubescent, the foliage glabrous or nearly so. Leaves distinctly petiolate, oblong or obovate-oblong, obtuse, entire, rather thick, flat, rarely exceeding  $\frac{1}{2}$  in. Flowers apparently all axillary, on very short pedicels, without bracts on the specimens seen. Calyx about 3 lines long when in flower, somewhat enlarged afterwards, the tube broad, scarcely striate, the lips equal, entire, scarcely half as long as the tube. Corolla slightly hairy outside, the tube shortly exceeding the calyx and scarcely dilated, the upper lip 4 to 5 lines long, concave, emarginate, the lobes of the lower lip much shorter, all fringed with rather long hairs. Stamens nearly as long as the upper lip of the corolla; anthers without any prominent appendages to the connective.

**Queensland.** Bottletree Creek, *Leichhardt*. F. Mueller (*Fragm.* vi. 106) includes this in *P. ovalifolia* of which it has nearly the foliage, but the flowers are totally different. It is very near to *P. ringens*, but with differently shaped leaves, and perhaps the corollas may not be quite the same. The two will require further comparison on better specimens.

35. **P. microphylla**, *A. Cunn. in Benth. Lab. Gen. et Sp.* 454 and in *DC. Prod.* xii. 562. A low bushy or scrubby shrub rarely above 1 ft. high, more or less scabrous-pubescent. Leaves very shortly petiolate, oblong or rarely oval-oblong, obtuse, thick, recurved from the base to the end, but without recurved or revolute margins, often all under 1 line long and very rarely exceeding 2 lines. Pedicels axillary, much shorter than the calyx and often not above  $\frac{1}{2}$  line long. Bracts small, close under the calyx. Calyx obscurely striate, pubescent or nearly glabrous, usually about 3 lines or rarely 4 lines long, the lips much shorter than the tube, equal and obtuse. Corolla scarlet, slightly pubescent, fully twice as long as the calyx, the tube exserted and slightly incurved, enlarged upwards, the upper lip erect, concave, emarginate, the lower lip much shorter. Stamens exserted but shorter than the upper lip; anthers with one appendage about as long as or shortly exceeding the cell, but very delicate and easily overlooked.—*Benth. in DC. Prod.* xii.

562; *P. coccinea*, F. Muell. in Hook. Kew Journ. viii. 168, and in Trans. Phil. Soc. Vict. i. 48.

**N. S. Wales.** Euryalean scrub, S.W. of Lachlan river, *A. Cunningham*.

**Victoria.** Dry arid places, Avoca and Murray Desert, *F. Mueller*; Lake Waringra, *Dallachy*.

**S. Australia.** Tumby Bay, *Wilhelmi*; Venus Bay, *Warburton*.

**W. Australia.** Towards Cape Riche, *Drummond*, 5th coll. n. 341; Phillips, Oldfield and Salt rivers, Eyre's Range, E. Mount Barren, &c., *Maxwell*.

*Cryphia serpyllifolia*, R. Br. Prod. 508, Benth. in DC. Prod. xii. 558, from Memory Cove, appears to me from the inspection of the original specimens to be identical with this plant. Brown, it is true, describes the corolla as shorter than calyx and concealed within it and derives from that circumstance his generic name. But he probably had only an imperfectly developed flower to examine. His specimens now show only calyxes past flower, and a few very young buds. *C. microphylla*, R. Br. l.c., from the same locality is evidently, as suggested by Brown, a minute-leaved variety of the same plant. The specimens have no flowers.

36. **P. aspalathoides**, *A. Cunn. in Benth. Lab. Gen. et Sp.* 453 and in *DC. Prod.* xii. 562. A low rigid bushy shrub, slightly scabrous-pubescent and sometimes perhaps viscid. Leaves linear-terete, very obtuse, channelled above, rather thick, contracted into a very short petiole, crowded on the smaller branchlets, rarely above 3 lines long. Pedicels axillary, usually very short and always much shorter than the calyx, the bracts close under the calyx. Calyx more or less pubescent, 4 or rarely 5 lines long, somewhat striate at the base, the lips obtuse or shortly acuminate, nearly equal and much shorter than the tube. Corolla twice as long as the calyx, slightly pubescent or nearly glabrous, the tube exserted, much enlarged upwards and incurved, the lips short, the upper one erect, emarginate and very broad, the lower one short, with 3 ovate lobes. Stamens exserted but not exceeding the upper lip; anthers without any appendage to the connective which is only slightly fringed.

**N. S. Wales.** Barren wastes S. W. of the Lachlan river, *A. Cunningham*, *Fraser*, *Mitchell*.

**Victoria.** Murray Desert, *F. Mueller*; Wimmera, *Dallachy*.

**S. Australia.** Sandy scrub, Kangaroo island, *Waterhouse*.

F. Mueller unites this and the two following species with *P. microphylla* under the name of *P. coccinea*, but the very marked differences in the foliage as well as in the shape of the corolla appear to me to be constant in all the specimens seen.

37. **P. calycina**, *F. Muell.* A rigid bushy shrub, more or less hoary-pubescent with short rigid hairs. Leaves very shortly petiolate, ovate or ovate-oblong, obtuse, entire, with recurved margins but the whole leaf rather incurved than recurved, contracted at the base, rarely under 2 lines and sometimes 4 lines long. Flowers axillary, nearly sessile or on pedicels not exceeding 1 line, the bracts short, linear, close under the calyx. Calyx 5 to 7 lines long, not striate, but with a prominent rib on each side decurrent from the junction of the lips, which are broad, obtuse, nearly equal and much shorter than the tube. Corolla slightly pubescent outside, with a broad straight tube slightly enlarged upwards and not exceeding the calyx, the lips very short, the

upper one erect and broad, the lower one broadly 3-lobed, and rather shorter than the upper one, the whole corolla not exceeding the calyx by more than a quarter of its length. Anthers without any or only with an exceedingly short appendage to the connective, but one cell tipped with a minute point.

**S. Australia.** Port Lincoln, *Wilhelmi*; Venus Bay, *Warburton*.

This species has the leaves nearly of *P. chlorantha*, but larger, and the large nearly sessile calyx and the corolla are very different from those of that species. The specimens seen are but very few.

38. ***P. chlorantha*, F. Muell. Herb.** A rigid divaricate shrub, with numerous small sometimes almost leafless branches, more or less sprinkled or scabrous with short crisped or almost stellate hairs. Leaves very small and shortly petiolate or almost sessile, broadly ovate or rhomboidal, obtuse, with revolute margins, all under 2 lines and mostly not 1 line long. Pedicels axillary, slender, 3 to 5 lines long, with a pair of bracts near the calyx or at a little distance below. Calyx pubescent, often reddish when dry, about 5 lines long, the lips nearly equal, more or less acuminate, rather shorter than the tube. Corolla "green," about twice as long as the calyx, slightly pubescent, the tube exserted, incurved, gradually enlarged, the limb very oblique, the upper lip erect concave emarginate, the lower one rather shorter, the lateral lobes ovate, the middle one broader. Anthers shortly exserted from the tube, without any appendage to the connective.—*Klanderia chlorantha*, F. Muell. in *Linnæa*, xxv. 426.

**S. Australia.** Mount Barker Creek, *L. Fischer*; Encounter Bay, *Whittaker*; Cygnet Bay, Kangaroo island, *Waterhouse*.

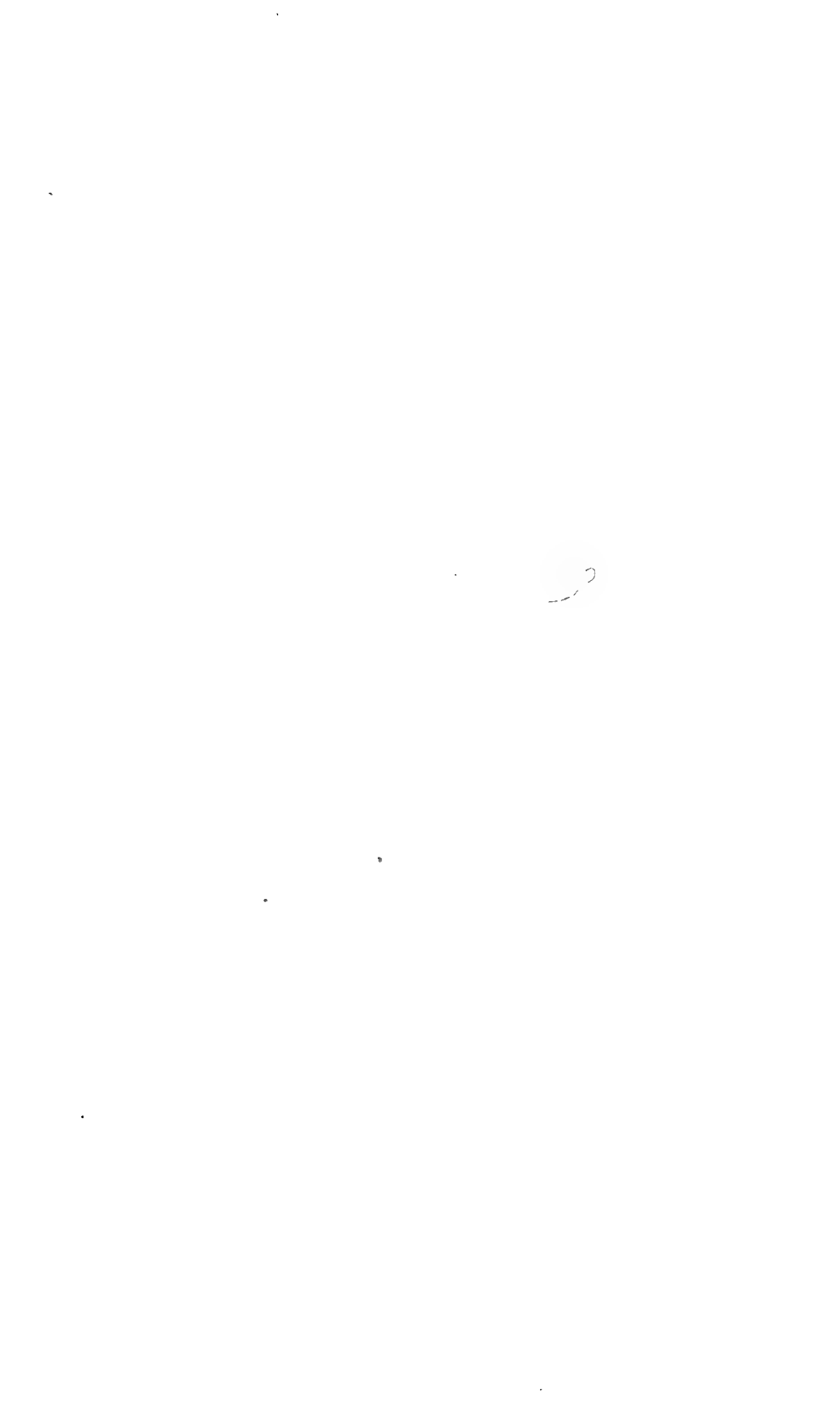
*P. Caley*, Benth. Lab. Gen. et Sp. 454, and in DC. Prod. xii. 562, from N. S. Wales, which, owing to the dispersion of the Lambertian herbarium, I am unable now to re-examine, must be very near *P. chlorantha*, with the same foliage and long pedicels; but, if the character I gave proves correct, it differs in the shorter corolla, and the presence of a short appendage to the connective. The form of the corolla having however not been specially described, I am unwilling formally to admit the species without further confirmation.

### 16. **HEMIANDRA**, R. Br.

Calyx 2-lipped or 5-toothed. Corolla with a broad campanulate throat, the upper lip short, erect, broadly 2-lobed, the lower longer, spreading, 3-lobed, the middle lobe often 2-lobed. Stamens 4, in pairs; anthers 1-celled, the connective elongated and produced beyond its insertion on the filament in a small tooth-like or shortly linear appendage. Style shortly bifid at the end. Nuts reticulate-rugose, attached to above the middle. Seeds albuminous.—Shrubs or undershrubs, usually diffuse but rigid. Leaves opposite, entire, narrow, rigid, pungent-pointed. Flowers axillary, solitary, with a pair of bracts under the calyx.

The genus is limited to West Australia. It only differs from *Hemigenia* in the pungent-pointed leaves and the shortness of the posterior end of the connectivum of





the anthers, and might be considered as a section of that genus were there any advantage in doing so compensating for the inconvenience of the change in nomenclature.

Calyx 2-lipped, the upper lip entire or with small lateral lobes, the lower 2-lobed.

- |   |                         |
|---|-------------------------|
| Calyx-lobes very acute or pungent-pointed . . . . .         | 1. <i>H. pungens</i> .  |
| Calyx-lobes, at least the lower ones, very obtuse . . . . . | 2. <i>H. leiantha</i> . |
| Calyx with 5 rigid subulate nearly equal teeth . . . . .    | 3. <i>H. incana</i> .   |

1. **H. pungens**, *R. Br. Prod.* 502. A diffuse or spreading (rarely erect?) rigid shrub, sometimes quite dwarf, sometimes ascending to 1 or 2 ft., quite glabrous or the branches only or also the leaves and calyxes hispid with rigid spreading hairs, often intermixed on the branches with a minute pubescence. Leaves sessile, linear or linear-lanceolate, rigid, acute with pungent points, flat or concave, with 1 to 5 parallel nerves very prominent underneath. Pedicels shorter than the leaves and sometimes very short, the bracts linear or lanceolate, rigid and pungent-pointed, close under the calyx. Flowers very variable in size, white or pink with darker spots. Calyx 2-lipped, the middle lobe of the upper lip broad, tapering into a pungent point, the lateral ones small and rounded or quite obsolete, the lower lip smaller, with 2 acute usually pungent-pointed lobes. Corolla-tube exserted and dilated into a broad throat, lobes of the lower lip usually all emarginate or crenate, the middle one much larger and 2-lobed, rolled over the anthers in the bud. Connective of the anthers forming usually a very small tooth below its insertion on the filament. Disk cup-shaped and thick, enclosing the base of the ovary. Style shortly and equally 2-lobed. Nuts attached by their inner face to above the middle.—Benth. in DC. *Prod.* xii. 564; Lemaire, *Jard. Fleur.* t. 126.

**W. Australia.** Very abundant from King George's Sound, *R. Brown* and many others, to Swan river, *Drummond*, *Preiss*, *Oldfield*, and others, and everywhere very variable as to the size of the flowers and the hairs. The following are the most marked forms:—

a. *grandiflora*. Glabrous or hispid. Leaves usually narrow, 1 to 1½ in. long. Calyx about ½ in., corolla 1¼ to 1½ in. long.—*H. linearis*, Benth. in *Hueg. Enum.* 79, and in DC. *Prod.* i. 564; *H. longifolia*, Bartl. in Pl. *Preiss.* i. 356.—Chiefly from Swan river, *Drummond*, 1st coll. also n. 10, 139, 449; *Preiss.* n. 2305, 2317.

b. *glabra*. Glabrous or scarcely hispid. Leaves spreading, broad and about ½ in. long, or narrow, more erect, and longer. Calyx about ½ in. long, with the lobes of the lower lip shorter, acute but not pungent, and much inflexed after flowering. Corolla nearly ¾ in. long.—*H. glabra*, Benth. in *Hueg. Enum.* 79; Bartl. in Pl. *Preiss.* i. 356; *H. juniperina*, Bartl. in Pl. *Preiss.* i. 355.—Chiefly Swan river, *Drummond*, 1st coll. n. 450, 2nd coll. n. 144, 145, 3rd coll. n. 191, 192, *Preiss.* n. 2307, 2308.

c. *diffusa*. Usually dwarf decumbent and hispid. Leaves spreading, linear-lanceolate, mostly about ½ in. long. Calyx ½ in.; corolla a little more than ½ in. long.—*H. brevifolia* and *H. hirsuta*, Benth. in *Hueg. Enum.* 79, and in DC. *Prod.* xii. 564; Bartl. in Pl. *Preiss.* i. 355.—The commonest form about King George's Sound, especially on the sandy shores, *R. Brown*, *Baxter*, *A. Cunningham*, &c.

d. *hispida*. The same as the var. c, but more erect and more hispid, the upper lip of the calyx after flowering rather more enlarged.—*H. rupestris*, *Hueg. Bot. Arch.* t. 4; Benth. in *Hueg. Enum.* 78, and in DC. *Prod.* xii. 564; Bartl. in Pl. *Preiss.* i. 354; *H. emarginata*, Lindl. *Bot. Reg.* 1841, Misc. 72 (from the character given)—Rocky hills, chiefly about King George's Sound, *Huegel* and others, *Drummond*, n. 12, 183, 193, 448.

e. *incana*. Pubescence short and more or less hoary, giving the plant the aspect of *H. incana*, but with the calyx of *H. pungens*. Corolla small, minutely pubescent.—*Drummond*, 3rd coll. n. 171, and some specimens of 1st coll. n. 450, *Preiss*, n. 2306.

It is possible that the observation of flowers in the recent state may supply characters to distinguish amongst the above at least two more definite varieties or species, but in the great majority of dried specimens the corollas are too much injured to ascertain their precise form and size.

2. *H. leiantha*, *Benth.* An erect bushy rigid shrub of 1 to 4 ft., our specimens all entirely glabrous. Leaves of the glabrous varieties of *H. pungens* and varying like them from lanceolate to linear, recurved or nearly straight,  $\frac{1}{2}$  in. to above 1 in. long, pungent-pointed, rigid, 3- to 5-nerved, smooth and shining. Flowers sessile or shortly pedicellate, usually about  $\frac{3}{4}$  in. long. Calyx with the upper lip broad, obtuse or scarcely acute in the centre and not pungent-pointed, the lower lip smaller 2-lobed, the lobes always very obtuse. Corolla of *H. pungens*, but quite glabrous. Anthers slender, the lower end of the connective much more prominent than in any of the flowers examined of *H. pungens*, although less so than in *H. incana*.

**W. Australia.** Murchison river, *Oldfield* (several forms differing chiefly in the length and breadth of the leaves), *Drummond*, (a single specimen in herb. F. Muell.)

3. *H. incana*, *Bartl. in Pl. Preiss.* i. 357. A shrub probably low and bushy, much branched, hoary-pubescent or shortly hispid. Leaves rather crowded, linear or linear-lanceolate, rigid, pungent-pointed, mostly 5-nerved,  $\frac{1}{2}$  to 1 in. long. Pedicels very short. Calyx 3 to 4 lines long, narrower than in *H. pungens*, rigid, striate, with 5 rigid pungent linear-subulate teeth, as long as the calyx, and nearly equal or more or less arranged in 2 lips. Corolla like that of *H. pungens* or perhaps with the lower lip not so long, but not seen very perfect. Connective produced below its insertion on the filament into a tooth usually longer than in the two preceding species, but perhaps variable.—*Benth. in DC. Prod.* xii. 565.

**W. Australia.** Swan river, *Drummond*, n. 75; *Preiss*, n. 2316. Resembles at first sight the var. *incana* of *H. pungens*, but the calyx is very different.

All the above species and varieties of *Hemiandra* require further illustration from the examination of fresh flowers, for in dried specimens the rigidity of the foliage has interfered very much with the proper desiccation of the corollas, which are usually withered up or destroyed.

## 17. HEMIGENIA, R. Br.

(*Colobandra*, *Bartl.* *Atelandra*, *Lindl.*)

Calyx 2-lipped or 5-toothed. Corolla with a dilated throat; the upper lip erect, more or less concave, emarginate or 2-lobed, the lower lip longer, spreading, 3-lobed, the middle lobe usually larger and often 2-lobed. Stamens 4, in pairs, anthers 1-celled, the connective elongated, produced beyond the insertion into an appendage or sterile branch, which in the upper pair is usually short dilated and bearded or crested







at the end with short hairs, in the lower pair or rarely in both pairs glabrous and attenuate or bearing an imperfect cell at the end. Style shortly bifid at the end. Nuts reticulate-rugose, attached to the middle or higher up. Seeds albuminous.—Shrubs or undershrubs. Leaves opposite or in whorls of 3, entire, obtuse or rarely acute and never pungent-pointed. Flowers all axillary, solitary or rarely clustered, with a pair of bracts under the calyx. Corolla hairy inside at the insertion of the stamens and usually at the base of the lower lip.

The genus is limited to Australia, and, with the exception of two species, to West Australia.

SECT. I. **Homalochilus**.—*Calyx 2-lipped, the lips broad, the upper one entire or broadly and shortly 3-lobed, the lower one entire or shortly 2-lobed and closed over the orifice of the tube, as in Prostanthera. Lower end of the connective of the lower anthers attenuate or slightly clavate.*

Leaves opposite.

Leaves obovate or oblong-cuneate. Pedicels very short.

Flowers  $1\frac{1}{2}$  in. long, the corolla twice as long as the calyx. 1. *H. macrantha*.

Leaves narrow. Pedicels as long as the calyx. Corolla not much exceeding the calyx . . . . .

2. *H. rigida*.

Leaves in whorls of 3. Flowers small.

Pedicels slender, longer than the calyx . . . . . 3. *H. ramosissima*.

Pedicels very short . . . . . 4. *H. microphylla*.

SECT. II. **Atelandra**.—*Calyx 2-lipped, the upper lip 3-lobed, the lower deeply 2-lobed, all the lobes acuminate (in the last two species the bilabiation less distinct). Lower end of the connective of the lower anthers attenuate. Leaves obtuse, contracted into a short petiole.*

Plant softly hoary or silky-villous.

Leaves mostly oblong and above 1 in. long on the main stems, shorter and more obovate on the branches . . . . .

5. *H. incana*.

Leaves mostly obovate and rarely exceeding  $\frac{1}{2}$  in. . . . .

6. *H. canescens*.

Plant closely hoary or silvery. Leaves mostly obovate or orbicular, rarely exceeding  $\frac{1}{2}$  in. . . . .

7. *H. podalyrina*.

Plant minutely glandular-pubescent, not hoary. Leaves mostly obovate or oval-oblong,  $\frac{1}{2}$  to 1 in. . . . .

8. *H. platyphylla*.

Plant glabrous or minutely hoary-pubescent. Calyx irregularly 2-lipped.

Leaves oblong or obovate-oblong . . . . . 9. *H. glabrescens*.

Leaves narrow-oblong or linear-cuneate . . . . . 10. *H. obtusa*.

SECT. III. **Hemigenia**.—*Calyx-teeth 5, nearly equal, subulate-acuminate or acute. Lower end of the connective of the lower anthers attenuate. Leaves sessile (except in *H. humilis*).*

Branches silky-villous or woolly. Flowers on the main branches clustered in the axils, rarely solitary on the smaller branchlets.

Leaves flat or concave, erect or spreading.

Leaves linear-lanceolate, cuneate or narrow-oblong, usually 1 in. or longer . . . . .

11. *H. sericea*.

Leaves broadly oblong, mostly about  $\frac{1}{2}$  in. . . . .

12. *H. barbata*.

Leaves complicate and recurved, oblong or ovate-lanceolate, mostly about  $\frac{1}{2}$  in. long . . . . .

13. *H. curvifolia*.

Glabrous hoary-pubescent or hirsute. Flowers all solitary.

Leaves mostly opposite. Western species.

Leaves oblong-cuneate, scabrous-pubescent or hirsute . . . . . 14. *H. scabra*.

- Leaves linear-oblong or cuneate. Plant hoary-pubescent . 15. *H. humilis*.  
 Leaves very narrow-linear or terete.  
 Pedicels 2 to 3 lines long. Calyx-teeth shorter than the tube . 16. *H. westringioides*.  
 Pedicels not 1 line long. Calyx-teeth longer than the tube . 17. *H. teretiuscula*.  
 Leaves in whorls of 3 or 4. Eastern species.  
 Leaves narrow-linear or terete . 18. *H. purpurea*.  
 Leaves oblong-cuneate . 19. *H. cuneifolia*.

SECT. IV. **Diplanthera**.—Calyx-teeth 5, nearly equal, subulate-acuminate or acute. Lower end of the connective of the lower anthers bearing an imperfect cell at the end. Leaves sessile, opposite.

- Leaves oblong or oblong-cuneate,  $\frac{1}{4}$  to nearly  $\frac{1}{2}$  in. long. Plant glabrous or minutely pubescent . 20. *H. Drummondii*.  
 Leaves oblong, 2 to 3 lines long. Plant hirsute. Flowers very small . 21. *H. pimelifolia*.  
 Leaves linear,  $\frac{1}{4}$  to  $\frac{1}{2}$  in. long. Plant glabrous . 22. *H. diplanthera*.

SECT. 1. **HOMALOCHILUS**.—Calyx 2-lipped, the lips broad, the upper one entire or broadly and shortly 3-lobed, the lower one entire or shortly 2-lobed and closed over the orifice of the tube as in *Prostanthera*. Lower end of the connective of the lower anthers attenuate or slightly clavate.

The species of this section differ considerably from each other in habit, but yet are not closely connected with any of those of other sections, and are all remarkable for their *Prostanthera*-like calyx.

1. **H. macrantha**, *F. Muell. Fragm.* i. 210. A shrub with erect virgate rather stout branches, hoary or white as well as the foliage with a close stellate tomentum, which disappears from the older leaves. Leaves opposite, erect or scarcely spreading, obovate or oblong-cuneate, very obtuse and sometimes minutely mucronate, contracted into a short petiole, rigidly coriaceous, with few rather prominent primary veins,  $\frac{1}{2}$  to 1 in. long. Flowers all axillary, on short pedicels. Bracts linear. Calyx attaining  $\frac{1}{2}$  to  $\frac{3}{4}$  in. after flowering, the upper lip ovate, contracted upwards but obtuse, entire, the lower one much shorter, with 2 short obtuse or almost acute lobes. Corolla glabrous, nearly  $1\frac{1}{2}$  in. long, the tube exerted and not much dilated at the throat, the upper lip long and narrow, arcuate, concave, emarginate, the sides spreading; lower lip shorter, with 3 rather narrow lobes. Stamens ascending under the upper lip and nearly as long, all the anthers with the lower end of the connective long linear and glabrous. Nuts very prominently reticulate.

**W. Australia.** Murchison river, *Oldfield, Drummond*, 6th coll. n. 142; *Lagrange Bay, Martin*.

The stellate pubescence of this species appears to be exceptional in the tribe and almost in the Order.

2. **H. rigida**, *Benth. in DC. Prod.* xii. 565. A glabrous shrub, apparently diffuse or loosely spreading as in *Hemiandra*, but the foliage not at all pungent. Leaves opposite, linear-oblong or linear-cuneate, obtuse, entire, contracted into a short petiole, coriaceous, concave, nerveless except the scarcely prominent midrib, mostly  $\frac{3}{4}$  to 1 in. long.

Pedicels axillary, slender, longer than the calyx but shorter than the leaves. Bracts from a broad base acutely acuminate, nearly as long as the calyx. Calyx 3 to 4 lines long, the upper lip broad, acute or acutely acuminate, the lower one shorter, with 2 acute lobes. Corolla not much longer than the calyx, glabrous outside, the upper lip short with 2 broad lobes, the lower lip much longer, with a large middle lobe emarginate or 2-lobed, all the lobes crenulate. Connective of the upper anthers clavate at the lower end and minutely bearded, of the lower anthers glabrous.

**W. Australia,** Drummond, 4th coll. n. 146.

3. **H. ramosissima**, Benth. in DC. Prod. xii. 565. A slender shrub, apparently diffuse, glabrous or with opposite lines of minute hairs decurrent on the branches. Leaves in whorls of 3, nearly sessile, linear, obtuse or acute, entire, rather rigid, 1-nerved, rarely above  $\frac{1}{2}$  in. long. Pedicels axillary, filiform, about as long as the leaves, very spreading, with a pair of linear-subulate bracts under the calyx. Calyx about  $1\frac{1}{2}$  lines long, broadly campanulate, glabrous, the upper lip broad, recurved, shortly and broadly 3-lobed, the lower one more or less distinctly 2-lobed with obtuse or scarcely acute lobes, and curved over the tube as in *Prostanthera*. Corolla not seen open. Anthers in the young bud similar to those of *H. rigida*.

**W. Australia.** Between Swan river and King George's Sound, a single specimen in the Hookerian herbarium, with numerous perfect calyces, but all past flower.

4. **H. microphylla**, Benth. in DC. Prod. xii. 565. A much-branched erect somewhat virgate shrub, with numerous small leaves and flowers, and quite glabrous. Leaves mostly in whorls of three, oblong lanceolate or almost linear, obtuse, entire, rather thick, under  $\frac{1}{2}$  in. long and sometimes not  $\frac{1}{4}$  in. Flowers all axillary, on very short pedicels. Bracts linear, acute, shorter than the calyx. Calyx  $1\frac{1}{2}$  to 2 lines long, like that of a *Prostanthera*, with 2 broad lips closed after flowering, the upper one rounded, obtuse and entire, the lower one rather smaller, entire or re-tuse. Corolla not twice as long as the calyx, glabrous outside, the tube about as long as the calyx, the upper lip short, erect, 2-lobed, the lower one longer, spreading, with undulate emarginate lobes, the middle one 2-lobed. Connective of the upper anthers dilated and slightly bearded at the lower end, that of the lower ones attenuate and glabrous.

**W. Australia,** Drummond, 3rd coll. n. 191 (and 151?); Harvey and Gordon rivers, Oldfield.

SECT. 2. ATELANDRA.—Calyx more or less distinctly 2-lipped, the upper lip 3-toothed or 3-lobed, the middle lobe usually larger than the lateral ones, the lower lip deeply 2-lobed, all the lobes acuminate. Lower end of the connective of the lower anthers attenuate or rarely clavate and glabrous.

5. **H. incana**, Benth. in DC. Prod. xii. 566. An undershrub or shrub attaining 2 or 3 ft., covered in every part with hoary or silky short

hairs, appressed and rather short on the stems and leaves, longer and more spreading on the calyxes and inflorescence. Leaves on the main stems oblong, obtuse, contracted into a very short petiole and 1 to 2 in. long, shorter and more petiolate on the side branches, the floral ones gradually smaller, and the upper ones scarcely exceeding the flowers. Flowers "pink" or "purple," shortly pedicellate or almost sessile, all axillary, but sometimes crowded into short axillary or terminal leafy racemes. Bracts linear or setaceous. Calyx very villous, nearly 3 lines long, the teeth lanceolate, very acute, in 2 lips, the upper one 3-lobed with the middle lobe larger, the lower deeply 2-lobed. Corolla about  $\frac{1}{2}$  in. long, shortly villous outside, the tube about as long as the calyx, the upper lip erect concave and emarginate, the lower one spreading and twice as long, with a large 2-lobed middle lobe. Lower end of the connective of the lower anthers clavate.—*Atclandra incana*, Lindl. Swan Riv. App. 40. t. 5 (the corolla reversed in the figure); *A. polystachya*, Lindl. l.c.; *Hemigenia polystachya*, Benth. in DC. Prod. xii. 566; *Colobandra robusta*, Bartl. in Pl. Preiss. i. 357.

**W. Australia.** Swan river, *Drummond*, 1st coll. n. 451, *Preiss*, n. 2313; Harvey river, *Oldfield*.

6. ***H. canescens***, Benth. in DC. Prod. xii. 566. A shrub of 1 to 2 ft., much less robust than *H. incana*, clothed with a hoary or silky-white pubescence, sometimes short and appressed, sometimes dense, long, and loose, and often wearing off from the upper surface of the leaves. Leaves opposite or very rarely in whorls of three, obovate from almost orbicular to oblong, obtuse, very spreading or recurved, contracted into a short petiole, thick and soft, rarely exceeding  $\frac{1}{2}$  in., sometimes very silky-white, sometimes quite green. Flowers small, solitary in the axils, on pedicels usually very short and rarely above 1 line. Calyx rather broad, 2 lines long when in flower, often 3 lines in fruit, the teeth rather broad, acute or almost obtuse, scarcely so long as the tube, the 3 upper ones nearly equal or the middle one larger, the 2 lower ones united in a shortly 2-lobed lip. Corolla about twice as long as the calyx, pubescent outside, apparently like that of *H. incana*, but not seen very perfect. Anthers of *H. incana*—*Colobandra canescens*, Bartl. in Pl. Preiss. i. 358 (from the character given).

**W. Australia**, *Drummond*, 1st coll., 3rd coll. n. 149; Hay district, *Preiss*, n. 2314 (*Bartling*); Salt river, *Maxwell*.

Var. *mollis*. More hirsute, the hairs more spreading, white or dark colour d, often mixed with a few glandular hairs.—*Colobandra mollis*, Bartl. in Pl. Preiss. i. 358; *Hemigenia mollis*, Benth. in DC. Prod. xii. 566.—York district, *Preiss*, n. 2310, also some specimens among *Drummond's*, n. 149.

*Colobandra lanata*, Bartl. l.c. 359 (*Hemigenia lanata*, Benth. l.c.) of which the flowers are unknown, is probably a more woolly form of the same species.

7. ***H. podalyrina***, F. Muell. *Fragm.* vi. 112. A spreading shrub of 1 to 2 ft., with the general aspect and foliage of *H. canescens*, of which it may possibly be a variety, but the indumentum is very close and short, hoary or silvery or reddish at the ends of the branches. Leaves obovate

or orbicular, contracted into a very short petiole, rarely above  $\frac{1}{2}$  in. diameter. Flowers in the upper axils, on very short pedicels. Bracts small, linear. Calyx open, 2 to 3 lines long, covered with the same appressed tomentum as the rest of the plant, the teeth short and broad, almost obtuse and more or less distinctly forming 2 lips, the middle upper tooth usually the largest. Corolla about  $\frac{1}{2}$  in. long, slightly pubescent outside, densely bearded inside at the throat. Anthers of *H. incana* and *H. canescens*.

**W. Australia.** Rocks on the Kalgan river, Oldfield, Maxwell.

8. **H. platyphylla**, Benth. in DC. Prod. xii. 566. A slender shrub or undershrub of about 2 ft., the branches and foliage pubescent with minute glandular hairs intermixed sometimes with a few longer ones, not glandular on the young shoots and pedicels, but not hoary or silky like the three preceding species. Leaves opposite, obovate to oval-oblong, obtuse, narrowed into a short petiole, 1-nerved or obscurely triplinerved,  $\frac{1}{2}$  to 1 in. long or smaller on the side branches. Flowers "lilac," all axillary on short pedicels. Calyx after flowering about 3 lines long, 2-lipped, the upper lip 3-lobed, the lower rather shorter and 2-lobed, all the lobes rather broad, acute or shortly acuminate but irregular. Corolla (which I have not seen) 5 lines long, the limb pubescent outside, the upper lip concave, bifid, the lower twice as long with undulate crenate lobes. Lower end of the connective of the upper anthers scarcely bearded.—*Colobandra platyphylla*, Bartl. in Pl. Preiss. i. 358.

**W. Australia.** Mount Bakewell, York district, Preiss, n. 2319 (Herb. DC. and F. Muell.).

*Colobandra subvillosa*, Bartl. in Pl. Preiss. i. 359 (*Hemigenia subvillosa*, Benth. in DC. Prod. xii. 566), from the same York district, is said to be very similar to *H. platyphylla*, but with villous branches, and is probably a variety only, as there are occasionally some non-glandular hairs on the typical *H. platyphylla*.

9. **H. glabrescens**, Benth. in DC. Prod. xii. 566. A shrub with slender branches, slightly hoary as well as the young foliage with short appressed hairs, at length nearly glabrous and without glandular hairs. Leaves opposite, oblong or obovate-oblong, obtuse, contracted into a short petiole, mostly  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, or on the side shoots under  $\frac{1}{2}$  in., green and glabrous or nearly so when full-grown. Flowers small, axillary, on short pedicels. Bracts linear. Calyx rather broadly campanulate, villous with spreading hairs, 2 lines, or after flowering 3 lines long, the teeth subulate-acuminate, irregularly 2-lipped. Corolla about twice as long as the calyx, pubescent outside, the upper lip short, broad and concave, the lower lip longer. Connective of the upper anthers bearded at the lower end, of the lower anthers glabrous and clavate at the tip.

**W. Australia**, Drummond, 1st coll. n. 452.

10. **H. obtusa**, Benth. in DC. Prod. xii. 567. A slender, apparently diffuse or spreading shrub, glabrous or more or less hoary with short appressed hairs. Leaves opposite, oblong or cuneate, usually narrow and sometimes almost linear, rarely almost obovate, obtuse, contracted

into a petiole, under  $\frac{1}{2}$  in. long. Flowers small, axillary, on pedicels sometimes above 1 line long, but usually short; bracts subulate. Calyx 2 lines, or after flowering nearly 3 lines long, shortly pubescent, the tube turbinate, the teeth not longer than the tube, acute or almost obtuse, more or less distinctly 2-lipped or almost equal. Corolla not twice as long as the calyx, pubescent outside. Connective of the upper anthers shortly bearded at the lower end, that of the lower anthers glabrous.

**W. Australia**, *Drummond*, 2nd coll. n. 147; plains near Observatory hill, Salt Lagoons, *Maxwell*.

SECT. 3. HEMIGENIA.—Calyx-teeth nearly equal, subulate-acuminate or acute. Lower end of the connective of the lower anthers attenuate. Leaves sessile, except in *H. humilis*.

11. **H. sericea**, *Benth.* in *Hueg. Enum.* 80, and in *DC. Prod.* xii. 567. A stout shrub of several feet, with erect branches more or less silky-villous or at length glabrous. Leaves opposite, sessile, erect or spreading, lanceolate or oblong, obtuse or mucronate, often contracted at the base, coriaceous, flat or concave, more or less silky-villous or silvery white when young, becoming glabrous when old, with few veins besides the midrib, mostly above 1 in. long. Flowers sessile or very shortly pedicellate, usually clustered in the axils with linear or linear-lanceolate bracts, rarely solitary on young side branches. Calyx usually about 3 lines long, the tube turbinate, the teeth lanceolate-subulate, nearly equal, longer than the tube. Corolla usually about  $\frac{1}{2}$  in. long, glabrous or nearly so outside. Connective of the upper stamens with the lower end broad and bearded, that of the lower stamens attenuate and glabrous.—*Bartl.* in *Pl. Preiss.* i. 360.

**W. Australia.** Swan river, *Fraser*, *Huegel*, *Drummond*, 1st coll., *Preiss*, n. 2333, *Oldfield* and others.

Var. *parviflora*. Leaves usually but not always narrow, and more contracted at the base, sometimes narrow-linear, silvery-white or nearly glabrous. Flowers smaller but variable in size, the calyx sometimes scarcely above 2 lines long.—*H. parviflora*, *Bartl.* in *Pl. Preiss.* i. 359; *Benth.* in *DC. Prod.* xii. 567.—With the typical form, *Drummond*, *Preiss*, n. 2321.

*Drummond*, n. 148 of the 3rd coll. with nearly glabrous very narrow or rather broad leaves, and n. 453 of the 1st coll. with silvery-white leaves, are in many respects intermediate forms, and to these varieties of *H. sericea* should probably be added *H. argentea*, *Bartl.* l.c. 360; *Benth.* in *DC. l.c.* 567, which I have not seen.

Var. *lanosa*, *F. Muell.* Leaves and flowers of the typical form, but the whole plant, especially the young parts densely woolly with long soft silky hairs.—*Drummond's last coll.*

12. **H. barbata**, *Bartl.* in *Pl. Preiss.* i. 360? Very closely allied to *H. sericea*, but the short broad leaves and loose indumentum give it a very different aspect. Young branches densely clothed with long loose spreading but silky hairs, which wear off with age. Leaves oblong, mostly rather above  $\frac{1}{2}$  in. long, and nearly  $\frac{1}{4}$  in. broad, loosely silky-villous on both sides. Flowers small, usually 2 in each axil, nearly sessile, each with 2 linear membranous hairy bracts. Calyx 2 to  $2\frac{1}{2}$  lines long, silky-villous, the teeth nearly equal, soft, acutely acuminate,

rather shorter or longer than the tube. Corolla glabrous, at least in the bud. Anthers of *H. sericea*, the lower end of the connective of the lower ones slightly clavate or attenuate.

**W. Australia**, *Drummond*, n. 77 (*Preiss*, n. 2320?). I have not seen *Preiss*'s specimens, but *Drummond*'s agree much better with *Bartling*'s description than the plant I referred to *H. barbata* in *DC. Prod.* xii. 566, which is but one of the small-flowered varieties of *H. sericea*.

13. **H. curvifolia**, *F. Muell. Fragm.* i. 210. A shrub of 2 or 3 ft., the branches woolly-hirsute, the young shoots silky-villous, the older foliage becoming glabrous. Leaves opposite, sessile, ovate-lanceolate or oblong, mostly acute, rigid, complicate, recurved,  $\frac{1}{2}$  in. long or rather more. Flowers rather small, clustered in the axils and in every respect like those of the small-flowered varieties of *H. sericea*.

**W. Australia**. Rocky hills, Hill river, *Oldfield*. There are but very few small specimens, more complete ones may possibly show this to be an extreme form of *H. sericea*.

14. **H. scabra**, *Benth.* Apparently an undershrub with slightly-branched erect stems of  $\frac{1}{2}$  to  $\frac{3}{4}$  ft., scabrous-pubescent or shortly hirsute as well as the foliage. Leaves opposite, or very rarely in whorls of 3, oblong-cuneate, very obtuse or truncate at the end, contracted at the base but scarcely petiolate, 4 to 8 lines long. Flowers small, solitary in the axils, on short pedicels. Bracts linear-lanceolate, often as long as the calyx. Calyx nearly 3 lines long, the teeth acute, rather broad, all equal, as long as the tube. Corolla only seen in bud. Connective of the upper anthers with the lower end dilated and bearded, that of the lower anthers attenuate and glabrous.

**W. Australia**, *Drummond*.

15. **H. humilis**, *Benth. in DC. Prod.* xii. 567. A low shrub or undershrub, much branched at the base, usually under 6 in. high, but growing out sometimes to near 1 ft., hoary with a minute velvety pubescence wearing off from the older foliage, and with a few rigid spreading hairs about the inflorescence. Leaves opposite, linear-linear-cuneate or oblong, obtuse, contracted into a short petiole, rather thick, flat, rarely above  $\frac{1}{2}$  in. long, and mostly shorter. Flowers small, solitary in the axils, on very short pedicels. Bracts linear-subulate, usually ciliate with rigid hairs. Calyx 2 lines, or after flowering 3 lines long, often hirsute and sometimes with a few glandular hairs, the tube turbinate, the teeth subulate-acuminate, nearly equal, longer than the tube. Corolla scarcely twice as long as the calyx, pubescent outside. Connective of the upper anthers broad and bearded at the lower end, that of the lower anthers narrow and glabrous or scarcely minutely bearded.

**W. Australia**, *Drummond*, 2nd coll. suppl. n. 49.

16. **H. westringioides**, *Benth. in DC. Prod.* xii. 568. A slender shrub with virgate branches, glabrous or minutely hoary-pubescent. Leaves opposite, sessile, very narrow linear or terete and channelled above, obtuse or mucronate-acute, contracted at the base,  $\frac{1}{2}$  to 1 in. long.



Flowers solitary in the axils, on pedicels of 2 to 3 or rarely 4 lines, with small subulate bracts near the calyx. Calyx usually minutely hoary-pubescent, about 3 lines long, the teeth broad, acute, nearly equal, much shorter than the tube. Corolla above twice as long as the calyx, glabrous outside. Connective of the upper anthers broad and bearded at the lower end, that of the lower anthers narrow and glabrous.

**W. Australia.** *Drummond*, 3rd coll. n. 152.

17. ***H. teretiuscula***, *F. Muell. Fragm.* vi. 111. A slender branching shrub, with the habit and foliage of *H. westringioides*, but quite glabrous, the pedicels very short, the calyx-teeth narrow, acute and about as long as the tube, and the corolla scarcely so large as in *H. westringioides*, of which it is probably a variety.

**W. Australia.** Stokes Inlet and Kydenup Range, *Maxwell*.

18. ***H. purpurea***, *R. Br. Prod.* 502. A slender twiggy heath-like shrub or undershrub, glabrous or with longitudinal rows of a minute pubescence on the branches. Leaves in whorls of 3 or 4, linear-terete, mucronate-acute or obtuse, channelled above, contracted at the base, and sometimes shortly petiolate, rarely above  $\frac{1}{2}$  in. long. Flowers "purple" or "blue," solitary and pedicellate or almost sessile in the upper axils. Bracts linear, shorter than the calyx. Calyx 2 to  $2\frac{1}{2}$  lines long, the tube turbinate, the teeth linear or linear-lanceolate, longer than the tube. Corolla not twice as long as the calyx, slightly pubescent outside, the lower lip twice as long as the upper. Connective of the upper anthers broad and bearded at the lower end, that of the lower anthers glabrous at the lower end, the cell at the upper end apparently perfect as usual in the genus.—*Benth.* in *DC. Prod.* xii. 568; *H. Sieberi*, *Benth. Lab. Gen. et Sp.* 457, and in *DC. Prod.* l.c.

**N. S. Wales.** Port Jackson to the Blue Mountains, *R. Brown, Sieber*, n. 191, *A. Cunningham*, and many others. On comparing a large number of specimens I am now persuaded that those with four leaves in a whorl (*H. Sieberi*, *Benth.*) do not otherwise differ from those which have only three.

19. ***H. cuneifolia***, *Benth.* A shrub probably of 2 or 3 ft., glabrous except the corolla. Leaves in whorls of 3, oblong-cuneate, obtuse or mucronate-acute, contracted into a rather long petiole, flat, green on both sides, about  $\frac{1}{2}$  in. long. Flowers small, solitary in the axils, shortly pedicellate. Bracts small, acute. Calyx  $1\frac{1}{2}$  to 2 lines long, quite glabrous, striate, the teeth all equal, acute, shorter than the tube. Corolla pubescent outside, not twice as long as the calyx, the upper lip broad erect concave and emarginate as in the preceding species, the lower lip longer and spreading. Upper stamens as in *H. purpurea*, with the connective dilated and bearded at the lower end, the lower stamens with the connective short, the cell at the upper end ovate but perhaps not perfect, the lower end linear and glabrous.

**N. S. Wales.** George river, very rare, *Woolfs*; Macleay river, *Beckler*.

The above specimens are referred by *F. Mueller*, *Fragm.* vi. 110, to *Westringia glabra*, which has something of the general aspect of this plant, but differently shaped



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leaves and very different corolla and anthers. The New England plant there mentioned is the true *H. glabra*. In *H. cuneifolia*, the cell of the lower stamens in the two flowers examined appeared to be not quite so perfect as is usual in *Hemigenia*, showing thus a passage to the genus *Microcorys*, although still nearer to *Hemigenia*, of which it has the corolla.

SECT. 4. DIPLANTHERA.—Calyx-teeth 5, nearly equal, subulate-acuminate or acute. Lower end of the connective of the lower anthers and sometimes of all the anthers bearing a second imperfect cell. Leaves sessile, opposite.

20. **H. Drummondii**, *Benth.* A perennial or undershrub (sometimes shrubby ?) all the specimens showing several simple or slightly branched stems erect from the rootstock, glabrous or with opposite decurrent lines of short hairs. Leaves opposite, sessile, oblong or oblong-cuneate, obtuse, entire, 1-nerved, minutely ciliate or quite glabrous, under  $\frac{1}{2}$  in. long. Pedicels short, with linear or linear-lanceolate ciliate bracts. Calyx about 3 lines long, sprinkled or ciliate with a few long spreading hairs, the teeth lanceolate, longer than the tube. Corolla twice as long as the calyx, the tube rather long, the upper lip concave below the lobes. Anthers rather large, the connective of the upper ones dilated and bearded at the lower end, that of the lower anthers bearing a second smaller cell probably sterile.

**W. Australia**, *Drummond*, last coll.

21. **H. pimelifolia**, *F. Muell. Fragm.* vi. 112. A shrub with slender divaricate branches, the young ones and foliage hirsute with long spreading hairs and opposite rows of shorter ones on the branches. Leaves opposite, sessile, obovate or oblong, obtuse, concave, rather thick, 2 to 3 lines long. Flowers solitary in the axils, nearly sessile. Bracts linear or linear-lanceolate. Calyx hirsute with long spreading hairs, under 2 lines long; the teeth narrow-lanceolate, nearly equal, rather obtuse, longer than the tube. Corolla scarcely exceeding the calyx, the lobes less unequal than in the other species. Connective of the upper anthers with the lower end dilated and bearded, that of the lower anthers with the lower branch elongated and terminating in a second cell nearly as large as the perfect one, but perhaps sterile.

**W. Australia**. Murchison river, *Oldfield*.

22. **H. diplanthera**, *F. Muell. Fragm.* vi. 111. A heath-like erect glabrous shrub or undershrub, sometimes bushy and under 6 in., sometimes more straggling, and attaining 1 to 3 ft., the smaller branches slender. Leaves opposite, linear or rarely linear-oblong, acute or obtuse, concave, contracted at the base, and sometimes shortly petiolate. Pedicels solitary in the axils, shorter than the calyx. Bracts subulate. Calyx 2 to  $2\frac{1}{2}$  lines long, the tube turbinate, the teeth nearly equal, broad or narrow, very acute, rarely as long as the tube. Corolla "white," the upper lip rather longer than the calyx, 2-lobed and scarcely concave below the lobes, the lower lip nearly twice as long as the calyx, 3-lobed, all the lobes nearly equally 2-lobed. Anthers all

with one perfect cell, the lower lobe of the connective ending in a second smaller and perhaps sterile slender cell in the lower stamens, and sometimes also in the upper ones, but sometimes the lower end of the latter dilated and bearded as in the other species of the genus, and in one flower I found a fifth imperfect stamen.

**W. Australia,** *Drummond, last coll.*

## 18. **MICROCORYS**, R. Br.

(*Anisandra*, *Bartl.*)

Calyx campanulate, 5-toothed. Corolla with a dilated throat, the upper lip very concave or hood-shaped, with the addition sometimes of 2 flat spreading lobes; lower lip spreading, 3-lobed. Stamens 2 (the upper ones) perfect, the connective elongated, produced beyond the insertion into a short lower branch usually dilated and bearded at the end, the 2 lower stamens (or staminodia) sterile and short, the anthers reduced to a small connective, with 2 linear or linear-clavate parallel branches. Style shortly bifid at the end. Nuts reticulate-rugose, attached to the middle or higher up. Seeds albuminous.—Shrubs or undershrubs. Leaves opposite or more frequently in whorls of 3 or 4, all entire. Flowers all axillary or rarely in terminal leafy heads, solitary within each floral leaf, with a pair of bracts under or below the calyx. Corolla usually hairy inside the tube, especially at the insertion of the stamens.

The genus is limited to Western Australia.

**SECT. 1. *Hemigenioides*.**—*Leaves opposite. Corolla-tube exerted, the upper lip concave, shortly lobed, not much shorter than or as long as the lowest lobe.*

Corolla narrow, above 1 in. long.

Leaves linear, with revolute margins. Pedicels rather long,  
upper corolla-lip longer than the lower . . . . . 1. *M. longifolia*.

Leaves ovate or elliptical-oblong with recurved margins. Pedicels short. Upper corolla-lip nearly as long as the lower . . . . . 2. *M. longiflora*.

Corolla broad,  $\frac{1}{2}$  in. long or less, the upper lip nearly as long as the lower.

Leaves narrow-linear . . . . . 3. *M. tenuifolia*.

Leaves ovate or oblong, flat . . . . . 4. *M. loganiacea*.

**SECT. 2. *Anisandra*.**—*Leaves in whorls of 3 or 4, flat or concave. Corolla-tube included or rarely exerted, the upper lip very concave or hood-shaped with 2 anterior spreading usually large lobes.*

Flowers in terminal leafy heads or spikes, the floral leaves much broader than the stem ones.

Leaves ovate . . . . . 5. *M. capitata*.

Leaves oblong-lanceolate . . . . . 6. *M. pimeleoides*.

Flowers all in the axils of leaves similar to the stem ones.

Leaves linear-cuneate, 3 to 5 lines long. Calyx silky or hoary . . . . . 7. *M. sulcanescens*.

Leaves under 3 lines, linear or oblong.

Calyx densely hirsute, with long spreading hairs.

Corolla-tube as long as the calyx . . . . . 8. *M. ericifolia*.

Calyx glabrous or slightly pubescent.

Corolla-tube twice as long as the calyx . . . . . 9. *M. exserta*.

Corolla-tube not exceeding the calyx . . . . . 10. *M. glabra*.





SECT. 3. **Microcorys**.—Leaves in whorls of 3 or 4. Corolla-tube included, the upper lip very short, concave or hood shaped, without large anterior lobes, the lower lip much longer.

Leaves linear, rarely above 3 lines long. Flowers very small.

Calyx glabrous or scarcely pubescent . . . . . 11. *M. virgata*.

Calyx very densely hirsute with white hairs . . . . . 12. *M. barbata*.

Leaves orbicular, flat, 1 to 2 lines diameter. Flowers very small.

Calyx very densely hirsute . . . . . 13. *M. lenticularis*.

Leaves broad, 3 to 6 lines long. Flowers large. Calyx glabrous or slightly hoary.

Leaves flat, obovate . . . . . 14. *M. obovata*.

Leaves ovate, with revolute margins . . . . . 15. *M. purpurea*.

SECT. 1. **HEMIGENIOIDES**.—Leaves opposite. Corolla-tube exerted, the upper lip concave, shortly lobed, not much shorter than or as long as the lowest.

1. ***M. longifolia***, Benth. in DC. Prod. xii. 568. Apparently a tall shrub, the branches and young shoots hoary with a minute tomentum. Leaves opposite, sessile, linear, obtuse, with revolute margins, becoming glabrous above when old, hoary or white underneath, above 1 in. and often nearly 2 in. long. Pedicels axillary, slender, spreading, often  $\frac{1}{2}$  in. long, with a pair of small linear-subulate bracts a little distance below the calyx, and there usually bent. Calyx rather narrow, slightly hoary, the tube nearly 3 lines long, the teeth narrow, acute, rather shorter than the tube, the uppermost usually larger than the others. Corolla slightly pubescent outside, above 1 in. long, the tube exerted and somewhat dilated upwards, the upper lip narrow, erect, concave, slightly emarginate, the lower one shorter, spreading, with 3 ovate entire lobes. Upper anthers with one large fertile cell, the lower end of the connective rather long, dilated at the end but scarcely bearded. Nuts less prominently reticulate than in most species.—*Hemigenia longifolia*, Benth. in Hueg. Enum. 80.

**W. Australia.** Swan river, Huegel, Drummond, 2nd coll. n. 214.

The long corollas of this and the following species give them more the aspect of *Hemigenia* than of *Microcorys*, but the lower anthers in both have the two linear sterile lobes of *Microcorys* without any perfect cell.

2. ***M. longiflora***, F. Muell. Fragm. vi. 113. A divaricately branched rather slender shrub, apparently 1 to 2 ft. high, the branches and young shoots minutely pubescent. Leaves opposite, petiolate, ovate to elliptical-oblong, obtuse, with recurved margins, glabrous above when old, pale or hoary underneath, mostly about  $\frac{1}{2}$  in. long, but varying from  $\frac{1}{4}$  to  $\frac{3}{4}$  in. Pedicels short but slender, often recurved, the bracts very short, linear-setaceous. Calyx 3 to 4 lines or rarely at length 5 lines long, the teeth lanceolate, acute, the upper one often as long as the tube, the others smaller. Corolla nearly 1 in. long, the tube slightly dilated upwards and much longer than the calyx, the lips short, the upper one erect and concave, the lower one scarcely longer, with three ovate lobes. Connective of the upper anthers dilated and bearded at the lower end.



**W. Australia.** Between Swan river and Cape Riche, *Drummond*, 5th coll. n. 340.

3. **M. tenuifolia**, *Benth.* A slender shrub, with much of the aspect of *Hemigenia westringioides*, but the branches and young shoots hoary or white with minute appressed hairs, and the stamens those of *Microcorys*. Leaves opposite, very narrow linear, obtuse or mucronate, thick, with slightly recurved margins, mostly  $\frac{1}{4}$  to  $\frac{3}{4}$  in. and sometimes nearly 1 in. long. Pedicels filiform, 2 to 3 lines long, with short setaceous bracts at some distance from the calyx. Calyx narrow, hoary with a minute pubescence, about 3 lines long, the teeth narrow-lanceolate, acute, rather shorter than the tube. Corolla pubescent, the tube not exceeding the calyx, the upper lip short, concave, broadly 2-lobed, the lower lip (rather longer?) 3-lobed. Connective of the upper stamens long, the lower end short, dilated and bearded.

**W. Australia**, *Drummond*, 4th coll. n. 172. The foliage and inflorescence are like those of *M. longifolia* but more slender, and the short broad corolla is very different.

4. **M. loganiacea**, *F. Muell. Fragm.* vi. 113. A shrub or undershrub, the stems not much branched,  $\frac{1}{2}$  to 1 ft. high or rather more, minutely scabrous-pubescent. Leaves opposite, ovate or oval-oblong, obtuse, flat, rather thick, contracted into a short petiole, nerveless except the midrib, minutely scabrous-pubescent or glabrous. Flowers nearly sessile or on pedicels of about 1 line. Bracts linear-lanceolate, sometimes as long as the calyx. Calyx more or less hirsute, about 3 lines long or at length nearly 4 lines, the teeth linear-lanceolate, longer than the tube and nearly equal. Corolla pubescent outside, scarcely twice as long as the calyx, the throat broad and open, the upper lip concave, with 2 short broad lobes, the lower one but little longer, with 3 broad fringed or crenate lobes. Connective of the upper anthers dilated and slightly bearded at the lower end. Nuts glabrous, slightly reticulate.

**W. Australia.** Towards Cape Riche, *Harvey, Drummond*, 4th coll. n. 168, *Maxwell*.

SECT. 2. **ANISANDRA**.—Leaves in whorls of three or rarely four, flat or concave. Corolla-tube included or rarely exserted, the upper lip very concave or hood-shaped, with 2 anterior spreading usually large lobes.

5. **M. capitata**, *Benth. in DC. Prod.* xii. 568. An erect rigid shrub, the branches often clustered and divaricate under the old inflorescences, the whole plant usually glabrous except the inflorescence. Leaves in whorls of 3, on exceedingly short petioles, ovate, acute or rather obtuse, coriaceous, flat, 1-nerved, under  $\frac{1}{2}$  in. long, the floral ones much broader not so thick and ciliate. Flowers solitary under each floral leaf, but collected in terminal globular or ovoid heads, the floral leaves imbricate and about as long as the calyx. Bracts very small, setaceous and ciliate or quite abortive. Calyx  $3\frac{1}{2}$  to 5 lines long, glabrous or slightly glandular-pubescent, the teeth rather broad, very acute or acu-

minate, much shorter than the tube. Corolla not much longer than the calyx, the upper lip erect, conspicuously helmet-shaped, with 2 anterior spreading lobes; lower lip spreading, 3-lobed. Filaments of the upper anthers short, the connective long and slender, with the lower end broadly oblong and shortly bearded.—*Westringia capitata*, Bartl. in Pl. Preiss. i. 362.

**W. Australia.** *Drummond*, n. 98, 4th coll. n. 143; Mount Baldhead, *Preiss*, n. 2334.

6. ***M. pimeleoides***, *F. Muell. Fragm.* i. 156. A robust shrub, quite glabrous or with minute opposite lines of pubescence along the branches. Leaves crowded, in whorls of 3, oblong-lanceolate, obtuse or almost acute, minutely petiolate, thick, concave, 3 to 4 lines long, the floral ones broader, almost ovate. Flowers almost sessile and crowded at the ends of the branches, but not so distinctly capitate as in *M. capitata*, the floral leaves about as long as the calyxes. Bracts small, linear or oblong. Calyx nearly 3 lines long, the teeth ovate or oblong-ovate, mucronate, as long as the tube, rather spreading. Corolla shortly pubescent outside, nearly twice as long as the calyx, the tube not exerted, the upper lip hood-shaped, with two large broad anterior spreading lobes, the lower lip of three broad undulate emarginate lobes. Connective of the upper anthers long, with a large acuminate lower lobe slightly bearded at the end.

**W. Australia.** Phillips range, *Maxwell*.

7. ***M. subcanescens***, *Benth.* An apparently small slender shrub, the branches and young shoots hoary or white with a close almost silky pubescence, the adult foliage glabrous. Leaves mostly in rather distant whorls of 3, linear-oblong or slightly cuneate, very obtuse, contracted into a very short petiole, coriaceous, 1-nerved, flat or concave, 3 to 5 lines long. Flowers axillary, nearly sessile. Bracts linear, at least as long as the calyx-tube. Calyx about 3 lines long, silky-pubescent, the teeth narrow-lanceolate, rather obtuse, about as long as the tube. Corolla pubescent outside, the tube shorter than the calyx, the upper lip scarcely exceeding the calyx-teeth, erect, very concave with 2 anterior spreading lobes, the lower lip longer, the lateral lobes obovate, the middle one broad and emarginate. Connective of the upper anthers with the lower lobe broad and ciliate.

**W. Australia,** *Maxwell*.

8. ***M. ericifolia***, *Benth. in DC. Prod.* xii. 569. A heath-like shrub of several ft., with virgate branches minutely pubescent in decurrent lines or glabrous. Leaves in whorls of 3, or rarely of 4, linear or oblong, obtuse, contracted at the base, thick and flat or concave, glabrous, sometimes all scarcely above 1 line long, in other specimens 2 to 3 lines, the floral ones similar but usually shorter than the calyx. Flowers axillary but usually crowded in leafy racemes towards the ends of the branches. Pedicels very short or nearly 1 line long. Bracts linear, often as long as the calyx-tube. Calyx 2 to 2½ lines long or after

flowering nearly 3 lines, narrower and more contracted at the base than that of *M. barbata*, densely hispid with spreading hairs longer and more rigid than in that species. Corolla glabrous or slightly pubescent outside, the tube as long as the calyx, the upper lip very concave or almost hood-shaped at the base with 2 large obovate-oblong erect but laterally spreading lobes, lower lip spreading, with a large and broad middle lobe. Connective of the upper anthers rather long, the lower lobe short and bearded. Nuts glandular-pubescent.

**W. Australia**, *Drummond*, 1st coll. n. 453 or 455, 2nd coll. suppl. n. 70. Notwithstanding some general resemblance to *M. barbata* this species is readily distinguished by the calyx twice as long, narrower and with much longer and more spreading hairs, and by the large lobes of the upper lip of the corolla.

*M. parvifolia*, Benth. in DC. Prod. xii. 569 (*Drummond*, 1st coll. n. 456) has small leaves and rather smaller flowers, but I have now seen too many ambiguous specimens to admit of distinguishing it even as a marked variety. A specimen of Roe's has the leaves all small and much broader than usual, some of them almost ovate.

9. ***M. glabra***, Benth. in DC. Prod. xii. 569.—A shrub of 1 to 3 ft. usually much branched, but less virgate and looser than *M. virgata*, the typical form glabrous in every part. Leaves in whorls of 3 or very rarely of 4, erect or spreading, scarcely petiolate, linear, obtuse, thick, flat or concave, rarely under 3 lines and often 4 lines long. Flowers axillary, on short pedicels, with very small linear obtuse bracts. Calyx  $1\frac{1}{2}$  lines long when in flower, afterwards attaining 2 lines, glabrous or slightly pubescent, the teeth lanceolate, usually obtuse and rather shorter than the tube, sometimes very short. Corolla quite glabrous outside, the tube shorter than the calyx, the upper lip very concave with 2 broad open anterior lobes, the lower lip much longer. Connective of the upper anthers longer than in *M. virgata*, the lower lobe dilated and bearded.—*Anisandra glabra*, Bartl. in Pl. Preiss. i. 361; *Microcorys brevidens*, Benth. in DC. Prod. xii. 569.

**W. Australia**, *Drummond*, 3rd coll. n. 150, 4th coll. n. 104; Konkoberup hills, *Preiss*, n. 2328; Salt river, Plantagenet and Stirling ranges, *Maxwell*.

Var. *gracilis*. Very slender in all its parts and heath-like. Leaves very narrow often almost terete, 2 to 3 lines long. Flowers smaller but the essential characters entirely those of *M. glabra*.—"Poor soil," no precise station, *Maxwell*.

Var. ? *pubescens*. Branches foliage and calyx pubescent with very short spreading hairs, the corolla and stamens as in the typical form.—Salt river ranges (with the leaves as in the typical form), Phillips river (with shorter and broader leaves), *Maxwell*.

10. ***M. exserta***, Benth. A shrub, probably of 2 or 3 ft., glabrous except the corolla, with numerous virgate branches. Leaves rather crowded, in whorls of 3 or 4, linear, obtuse or almost acute, contracted into a short petiole, thick, flat or concave, under 3 lines and often not 2 lines long. Flowers nearly sessile in the upper axils. Bracts very small, linear, deciduous. Calyx glabrous or slightly pubescent, under 2 lines long when in flower, above that when in fruit, the teeth ovate, slightly mucronate, shorter than the tube. Corolla pubescent outside, the tube slender, exserted (about half as long again as the calyx), the upper lip short, broad, very concave, with spreading anterior lobes, the

lower lip much longer, with broad lobes. Connective of the upper anthers rather long, with a broad lower lobe bearded at the end.

**W. Australia.** East river, Stokes Inlet, *Maxwell*, and some specimens in *Drummond's 3rd coll. n. 151*. With the habit and foliage of *M. ericifolia* and *M. virgata*, this is at once distinguished by the corolla tube, which, when perfect, is fully 3 lines long.

**SECT. 3. MICROCORYS.**—Leaves in whorls of three or rarely four. Corolla-tube not exceeding the calyx-teeth, the upper lip very short, concave or hood-shaped, slightly emarginate, without the two large spreading lobes of *Anisandra*, the lower lip much longer, spreading.

11. ***M. virgata*, R. Br. Prod. 502.** An erect shrub with erect or spreading slender virgate branches, the whole plant glabrous except the corolla. Leaves in whorls of 3, linear, obtuse, contracted at the base, but scarcely petiolate, thick, flat or concave, rarely exceeding 3 lines, the floral ones similar or rather smaller. Flowers all axillary and nearly sessile, but frequently forming terminal leafy racemes. Bracts very small and falling off early so as to be rarely seen. Calyx  $1\frac{1}{4}$  or rarely  $1\frac{1}{2}$  lines long, glabrous, the teeth ovate, obtuse or shortly mucronate, shorter than the tube, sometimes shortly ciliate. Corolla hirsute outside with long stiff hairs (except the upper part of the lower lobes) the upper lip not exceeding the calyx, very broad, concave, very shortly emarginate or sinuate-lobed, lower lip more than twice as long, with broadly obovate spreading lobes. Connective of the upper anthers short, the lower dilated and bearded lobe nearly as long as the perfect cell.—Benth. in DC. Prod. xii. 569; Bartl. in Pl. Preiss. i. 362.

**W. Australia.** Boggy ground, King George's Sound, *R. Brown, A. Cunningham*; rocks of Mount Wulgenup, *Preiss, n. 2330*; also *Drummond, 4th coll. n. 169*.

*M. selaginoides*, Bartl. in Pl. Preiss. i. 363, Benth. in DC. Prod. xii. 569, from moist shady bogs, Twopeopled Bay, *Preiss, n. 2332*, from the single not very good specimens seen, appears to be a slight variety of *M. virgata*, with the branches minutely hoary-pubescent, and the leaves slightly scabrous with minute hairs.

12. ***M. barbata*, R. Br. Prod. 502.** A shrub with slender virgate branches, glabrous or with minutely pubescent decurrent lines, the foliage quite glabrous. Leaves in whorls of 3, linear, obtuse, thick, concave or almost terete, contracted into a short petiole, 2 to 3 or very rarely 4 lines long, the floral ones similar but often smaller. Flowers very small, all axillary but forming long leafy racemes and very conspicuous from the white silky hairs of the calyx. Calyx scarcely  $1\frac{1}{4}$  lines long, densely hirsute with white spreading hairs, the teeth broadly oblong, almost obtuse, about as long as the tube. Corolla pubescent outside, the upper lip scarcely exceeding the calyx, broad, concave, shortly sinuate-lobed, the lower lip much longer and spreading. Connective of the upper anthers short, the lower dilated and bearded lobe nearly as long as the perfect cell. Nuts hirsute.—Benth. in DC. Prod. xii. 569.

**W. Australia.** Lucky Bay, *R. Brown*; to the eastward of King George's Sound? *Barter, Drummond, 4th coll. n. 167*; Kojonerup valley, Oldfield river and Esperance Bay, *Maxwell*.

13. **M. lenticularis**, *F. Muell. Fragm.* vi. 113. A shrub with the slender virgate branches and hispid calyxes of *M. barbata*, quite glabrous or with minutely pubescent decurrent lines. Leaves in whorls of three, very broadly ovate or orbicular, obtuse, thick, flat or concave, shortly but distinctly petiolate, 1 to nearly 2 lines diameter. Flowers in the upper axils nearly sessile. Calyx after flowering ovoid-globular, densely hirsute with whitish spreading hairs, rather above 1 line long, the teeth rather broad and usually shorter than the tube. Corolla and stamens not seen. Nuts pubescent.

**W. Australia**, *Drummond*, 3rd coll. n. 196.

14. **M. obovata**, *Benth. in DC. Prod.* xii. 569. An erect bushy shrub, the branches and young shoots hoary with minute appressed hairs, the adult foliage glabrous. Leaves mostly in whorls of three, obovate, obtuse, contracted into a very short petiole or almost sessile, flat, coriaceous, nerveless, 3 to 4 lines long. Flowers axillary, on very short pedicels, with small linear-setaceous ciliate bracts. Calyx about 2 lines long or at length rather longer, glabrous or nearly so, the teeth acute, rather broad, about as long as the tube. Corolla nearly  $\frac{1}{2}$  in. long, slightly pubescent outside, the tube longer than the calyx, the upper lip short, broad, concave, without the spreading anterior lobes of *Anisandra*, the lower lip three times as long, with broad lobes. Connective of the upper anthers dilated and bearded at the lower end.

**W. Australia**, *Drummond*, n. 69 and 3rd coll. n. 195.

15. **M. purpurea**, *R. Br. Prod.* 502. A bushy or spreading shrub of 2 to 3 ft., the branches and young shoots hoary-pubescent with short appressed hairs, the adult foliage often glabrous. Leaves in whorls of 3, on very short petioles, ovate, obtuse or scarcely acute, with recurved margins, green above, pale or hoary and long retaining their pubescence underneath, rarely above  $\frac{1}{2}$  in. long. Flowers "purple" or "puccoloured," all axillary and distant, on short pedicels with minute bracts. Calyx hoary-pubescent,  $2\frac{1}{2}$  to nearly 3 lines long, the teeth narrow, much longer than the tube. Corolla-tube shorter than the calyx, the upper lip not at all or scarcely exceeding the calyx-teeth, broad, concave, very shortly lobed, the lower lip much longer and spreading. Connective of the upper anthers about as long as the cell, the lower lobe very short, broad and bearded at the end. Nuts glabrous.—*Benth. in DC. Prod.* xii. 569.

**W. Australia.** Lucky Bay, *R. Brown*; overhanging rocks, Cape Arid, *Maxwell*. Some very bad specimens of *Drummond's* in herb. *F. Mueller*, with shorter and more oblong leaves and a more compact inflorescence, may nevertheless possibly belong to this species.

*Westringia serpyllifolia*, *Bartl. in Pl. Preiss.* i. 362; *Benth. in DC. Prod.* xii. 571, from near Mount Manypeak; *Preiss.* n. 2312, of which I formerly saw a very imperfect specimen in Herb. DC., and of which the corolla and stamens are unknown, is most probably the *Microcorys purpurea*.











## 19. WESTRINGIA, Sm.

Calyx campanulate, 5-toothed. Corolla with a short tube and dilated throat; the upper lip erect but flat and broadly 2-lobed, the lower spreading, 3-lobed. Stamens 2 (the upper ones) perfect, the anthers 1-celled with a short slightly prominent connective not produced below its insertion on the filament, the 2 lower stamens (or staminodia) sterile and short, the anthers reduced to a small connective with 2 linear or linear-clavate parallel branches. Style shortly bifid at the end. Nuts reticulate-rugose, attached to the middle or higher up. Seeds albuminous.—Shrubs. Leaves in whorls of three, four or rarely more, all entire. Flowers all axillary or rarely in terminal leafy heads, with a pair of bracts under the calyx usually very small and sometimes almost obsolete. Corolla usually hairy inside the tube, especially at the insertion of the stamens.

The genus is limited to Australia. With the exception of *W. cephalantha*, the species are so closely allied, and run so much into each other as to render it exceedingly difficult to assign to them any tangible characters. The chief differences observed are in the number of leaves in the whorl, in the relative abundance or absence of the hoary tomentum, and in the length of the teeth of the calyx, none of which are quite constant in any one species. The corolla might perhaps in some instances supply better characters, but they can only be ascertained by the observation of living specimens; the want of any concavity in the upper lip at once distinguishes the genus from *Microcorys*.

Flowers in globular terminal heads with bract-like floral leaves not exceeding the calyx . . . . .

Flowers all in the axils of leaves not differing from the stem ones (distant or crowded at the ends of the branches).

Leaves very white underneath, often not much revolute.

Calyx-teeth above half as long as the tube.

Leaves in threes, oblong-elliptical,  $\frac{1}{2}$  to 1 in. long . . . . .

Leaves in fours, oblong-lanceolate or linear,  $\frac{1}{2}$  to 1 in. long . . . . .

Leaves in fours, 3 to 4 lines long . . . . .

Leaves very much revolute, rigid. Calyx-teeth very short.

Leaves mostly in fours . . . . .

Leaves mostly in threes . . . . .

Leaves much revolute, rigid, in fives or sixes. Calyx-teeth as long as the tube . . . . .

Leaves narrow-linear, slender, much revolute, mostly in threes. Calyx-teeth as long as the tube . . . . .

Leaves not much revolute or flat, green on both sides as well as the calyx.

Leaves in threes, linear, often above 1 in. long. . . . .

Leaves in threes, oblong-elliptical or lanceolate, under 1 in. long . . . . .

Leaves in fours, oblong-elliptical or lanceolate, under  $\frac{1}{2}$  in. long . . . . .

1. *W. cephalantha*.

2. *W. grandifolia*.

3. *W. rosmariniformis*.

4. *W. brevifolia*.

5. *W. Dampieri*.

6. *W. rigida*.

7. *W. senifolia*.

8. *W. eremicola*.

9. *W. longifolia*.

10. *W. glabra*.

11. *W. rubicifolia*.

1. *W. cephalantha*, *F. Muell. Fragm.* vi. 110. An erect bushy shrub, glabrous except the inflorescence. Leaves in whorls of 3, 4 or rarely 5, linear, obtuse or almost acute, with revolute margins, shining and black when dry, rarely exceeding  $\frac{1}{2}$  in., the floral ones passing into linear concave rather thin ciliolate bracts. Flowers sessile and

solitary within each floral leaf, collected into dense globular terminal heads of 3 or 4 lines diameter, the bract-like floral leaves not exceeding the calyxes and the real bracts usually wanting. Calyx  $1\frac{1}{4}$  to  $1\frac{1}{2}$  lines long, the teeth very obtuse, irregularly separating to below the middle. Corolla pubescent outside, the tube about as long as the calyx, the upper lobes erect and obovate, the lower ones spreading, all flat obovate and entire, or the middle lower one emarginate. Stamens of *Westringia*, except that, at least in the flowers examined, the anthers of the lower pair (or staminodia) are entirely abortive.

**W. Australia.** *Drummond*, 4th coll. n. 170 and 5th coll. suppl. n. 76. Although the inflorescence is so nearly that of *Microcorys capitata*, the foliage and flowers are very different.

2. **W. grandifolia**, *F. Muell. Herb.* A tall shrub with the habit and white indumentum of *W. rosmariniformis*. Leaves in whorls of 3, oblong-elliptical,  $\frac{1}{2}$  to 1 in. long, the margins slightly revolute, green above, white underneath. Flowers all axillary. Calyx very white, about 4 lines long, the teeth nearly as long as the tube. Corolla pubescent, nearly that of *W. rosmariniformis*, but the lobes appear to be shorter and broader, and the upper lip rather shorter than the lower.

**Queensland.** Glasshouse mountains, *F. Mueller*, and probably the same species but the specimens not in flower, *Biroa*, *Leichhardt*.

*F. Mueller* now proposes to reduce this to *W. rosmariniformis*, but the characters appear as distinct as those of most *Westringia*.

3. **W. rosmariniformis**, *Sm. Tracts*, 282, t. 3. A robust bushy shrub of several ft., the branches underside of the leaves and calyxes hoary or silvery-white with densely appressed hairs. Leaves in whorls of 4, oblong-lanceolate lanceolate or linear, acute or obtuse,  $\frac{1}{2}$  to 1 in. long, coriaceous, glabrous and shining on the upper side, the margins more or less recurved or revolute. Flowers almost sessile, all axillary, with short linear bracts. Calyx about 3 lines long, the teeth acute, varying from half the length to nearly the length of the tube. Corolla pubescent outside, not twice as long as the calyx, the upper lip deeply 2-lobed, equal to or longer than the tube, the lower lip scarcely so long. Anthers of the staminodia with 2 linear clavate parallel lobes. Nuts glabrous, reticulate-rugose.—*Benth* in *DC. Prod.* xii. 570; *R. Br. Prod.* 501; *Cunila fruticosa*, *Willd. Spec. Pl.* i. 122; *W. rosmarinacca*, *Andr. Bot. Rep.* t. 214.

**N. S. Wales.** Sandy hills near the sea-coast, Port Jackson, *R. Brown*, *Sieber*, n. 266, and others; northward to Port Macquarrie, *Backhouse*, and southward to Cape Howe, *Mossman*.

4. **W. brevifolia**, *Benth. Lab. Gen. et Sp.* 459, and in *DC. Prod.* xii. 570. Very near *W. rosmariniformis*, with which *F. Mueller* proposes to unite it, but it is a much smaller plant and its short leaves and small flowers give it a very different aspect. Leaves in whorls of 4, oblong or elliptical-lanceolate, hoary or white underneath, usually 3 to 4 lines long, or in *Hannaford*'s very luxuriant specimens about  $\frac{1}{2}$  in. Flowers like those of *W. rosmariniformis* but much smaller, the stamens usually

more exserted. Calyx-teeth as in that species about half the length of the tube or rather more.—Hook. f. Fl. Tasm. i. 285, t. 91.

**W. Australia.** South of Launceston, *Gunn, Hannaford*.

5. **W. Dampieri**, *R. Br. Prod.* 501. A rigid bushy shrub usually more scrubby than *W. rosmariniformis* but attaining several feet, the young shoots and under-side of the leaves often hoary, but less white than in that species, sometimes the whole plant slightly but equally hoary or altogether nearly green. Leaves in whorls of 4, or very rarely of 3 on the side-branches, linear, much revolute, the upper surface smooth or scabrous, varying in length but usually about  $\frac{1}{2}$  in. Flowers axillary, nearly sessile, about the size of those of *W. rosmariniformis*, but the corolla more hirsute and the calyx with a striate tube of about 2 lines and the teeth whether narrow or broad always very short and acute, usually not  $\frac{1}{4}$  the length of the tube.—Benth. in DC. Prod. xii. 570; Bartl. in Pl. Preiss. i. 361; Bot. Mag. t. 3308.

**Tasmania.** Peaks of Flinders island and between Huon river and Oyster Bay, *Milligan*; Port Esperance, *Oldfield*; South Port, *C. Stuart*. The Tasmanian specimens, however, although undistinguishable from several western ones of *W. Dampieri*, may be only a 4-leaved variety of *W. angustifolia*, Br., the common 3-leaved form of which I am unable to distinguish from *W. rigida*.

**W. Australia.** King George's Sound and to the eastward, *R. Brown, Baxter, Drummond*, n. 47 and 5th coll. n. 342, *Preiss*, n. 2325, *Maxwell*.

6. **W. rigida**, *R. Br. Prod.* 501. A rigid bushy scrubby shrub, scarcely to be distinguished from *W. Dampieri* by any constant characters. It varies also like that species in the indumentum, sometimes hoary all over or green all over, usually the young shoots and under-side of the leaves only hoary and never so white as in *W. rosmariniformis*. Leaves mostly in whorls of 3, but here and there of 4, linear, obtuse or mucronate-acute, rigid with much revolute margins, usually glabrous above when full-grown and either smooth and shining or scabrous with minute tubercles, varying from scarcely 2 lines long and thick and broad in some specimens, to above  $\frac{1}{2}$  in. and more slender in others, with every intermediate size. Flowers of *W. Dampieri*, with the same very short teeth to the calyx, which varies from very hoary to quite green.—Benth. in DC. Prod. xii. 570; Bartl. in Pl. Preiss. i. 361; *W. grevillina*, *F. Muell.* in Hook. Kew Journ. viii. 169 and in Trans. Phil. Soc. Vict. i. 49.

**Victoria.** Avoca and Murray rivers, *F. Mueller*; Wimmera, *Dallachy*.

**Tasmania.** See below, *W. angustifolia*.

**S. Australia.** Fowler and Petrel Bay, Waldegrave and Flinders islands, *R. Brown*; Salt Creek, *Behr*; Murray Creek to St. Vincent's Gulf, *F. Mueller*; Port Lincoln, *Wilhelmi*.

**W. Australia.** *Drummond*, n. 194, *Harvey*; and rocky shores of Rottenest Island, *A. Cunningham*, *Preiss*, n. 2309; Sharks Bay, *Milne*; Murchison river, *Oldfield*.

This species differs generally from *W. Dampieri* in the shorter more rigid leaves in whorls of 3 only; but none of these characters are constant, the primary branches even of the most characteristic short-leaved forms having occasionally the leaves in fours, the short calycine teeth and the corollas are the same in both species which

might well be united as suggested by F. Mueller, in which case the name of *W. Dampieri* might be given to the whole.

*W. cinerea*, R. Br. Prod. 501, Benth. in DC. Prod. xii. 570, only differs from the longer-leaved form of *W. rigida* in being more hoary than usual, the plant figured Bot. Mag. t. 3307 is still more hoary with the leaves longer than in any of the Continental wild specimens.

*W. angustifolia*, R. Br. Prod. 501, Benth. in DC. Prod. xii. 571; Hook. f. Fl. Tasm. i. 285, from the central and southern parts of Tasmania, *R. Brown* and others, does not appear to me to differ in the slightest degree from the longer-leaved continental specimens of *W. rigida*; in S. and W. Australia, as in Tasmania, the leaves are sometimes very scabrous sometimes quite smooth. The specimens from between Oyster Bay and Huon river, *Milligan*, and from the Mersey river, *C. Stuart*, have the leaves sometimes in threes sometimes in fours, thus still further connecting *W. rigida* with *W. Dampieri*. F. Mueller refers them to *W. rosmariniformis*, but they have all the very short calyx-teeth of *W. Dampieri*. A few specimens of *C. Stuart*'s have remarkably long leaves, attaining almost 2 inches.

7. ***W. senifolia***, F. Muell. in Hook. Kew Journ. viii. 169, and in Trans. Phil. Soc. Vict. i. 49. An erect robust bushy shrub of 2 to 4 ft., more or less hirsute with white hairs, sometimes silky but looser and longer than in the other species, occasionally wearing off from the older leaves. Leaves crowded, in whorls of 5 or 6, linear, acute or almost obtuse, rigid, the margins much revolute, mostly about  $\frac{1}{2}$  in. long. Flowers axillary, sessile. Calyx-tube  $1\frac{1}{2}$  or at length 2 lines long, the teeth subulate-acuminate, nearly or quite as long as the tube. Corolla slightly pubescent outside, the lobes all nearly equal or the middle lower one rather longer, and not very much exceeding the calyx-teeth.

**Victoria.** Mount Aberdeen, Buffalo Range, F. Mueller.

Var. *canescens*. Shortly hoary, like *W. rigida*, but with the crowded whorls of 5 or 6 leaves, the long calyx-teeth and small corollas of *W. senifolia*.

**W. Australia.** Phillips river, Maxwell.

8. ***W. eremicola***, A. Cunn. in Benth. Lab. Gen. et Sp. 459, and in DC. Prod. xii. 571. A shrub of several ft. with erect often virgate rather slender branches more or less hoary or silky-pubescent as well as the leaves with appressed hairs, the older foliage becoming glabrous. Leaves usually in whorls of 3, narrow-linear, acute or mucronate, with revolute margins, more slender than in the preceding species and rarely above  $\frac{1}{2}$  in. long. Flowers rather small, usually distant. Calyx hoary, the tube about  $1\frac{1}{2}$  lines long, the teeth subulate or rarely lanceolate-subulate, as long as or sometimes longer than the tube. Corolla pubescent outside, smaller than in any of the preceding species except *W. senifolia*, the upper lip shorter than the middle lobe of the lower lip and not deeply lobed, the lobes all rather narrow and emarginate.—Bot. Mag. t. 3438; *W. longifolia*, Lindl. Bot. Reg. t. 1481, not of R. Br.

**Queensland.** Brisbane river, Moreton Bay, F. Mueller, C. Stuart.

**N. S. Wales,** Arid wastes on the Lachlan. A. Cunningham, Fraser.

**Victoria.** Genoa and Towamba rivers, F. Mueller (included by him in Fragn. vi. 110, in *W. longifolia*).

Var. ? *quaterna*. Leaves in whorls of 4.—Shoalhaven gullies, near Glenroch, Herb. F. Mueller (the collector not named).

9. ***W. longifolia***, *R. Br. Prod.* 501. An erect shrub of several ft., without any of the hoary tomentum or hairs of the preceding species either on the foliage or calyxes and very rarely and only in a very slight degree on the young branches. Leaves in whorls of 3, narrow-linear, the margins somewhat revolute or nearly flat, above  $\frac{1}{2}$  in. and mostly above 1 in. long. Flowers rather small, axillary. Calyx-tube 1 to  $1\frac{1}{4}$  lines long, 5-ribbed, green and smooth, the teeth lanceolate-subulate, usually about as long as the tube and often ciliate. Corolla pubescent outside, the tube exerted and usually exceeding the calyx-teeth, dilated upwards, the upper lip much shorter than the tube, broadly 2-lobed, the middle lobe of the lower lip much longer. Connective of the perfect anthers very prominent and (in some specimens at least) almost winged at the back.—Benth. in DC. *Prod.* xii. 571; *Prostanthera linearis*, Sieb. Pl. Exs., not of *R. Br.*

**N. S. Wales.** Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, n. 180, and many others.

10. ***W. glabra***, *R. Br. Prod.* 501. A bushy shrub of 2 or 3 ft., quite glabrous or the young branches slightly silky-pubescent, the leaves on both sides and the calyxes quite green. Leaves in whorls of 3, shortly petiolate, from oblong-elliptical to lanceolate, from under  $\frac{1}{2}$  in. to nearly 1 in. long, acute or obtuse, flat or the margins slightly recurved, smooth and often shining on the upper surface. Flowers of *W. longifolia*, the calyx-teeth usually lanceolate, about as long as the tube.—Benth. in DC. *Prod.* xii. 571; *W. violacea*, F. Muell. in Hook. *Kew Journ.* viii. 169, and in *Trans. Phil. Soc. Vict.* i. 49.

**Queensland.** Shoalwater Bay, *R. Brown*.

**N. S. Wales.** New England, *C. Stuart*.

**Victoria.** Near the Goulburn river, *F. Mueller*.

For the other stations mentioned by F. Mueller, *Fragm.* vi. 110, see *Hemigenia cuneifolia*.

11. ***W. rubiæfolia***, *R. Br. Prod.* 501. A dense bushy shrub of 1 to 3 ft., quite glabrous or the young branches pubescent. Leaves in whorls of 4, oblong-elliptical or lanceolate, mucronate-acute or almost obtuse, the margins usually slightly recurved, glabrous, smooth and shining above, paler but not hoary underneath. Flowers rather small, all axillary but usually crowded towards the ends of the branches. Calyx green, the tube ribbed, scarcely above 1 line long, the teeth acute, nearly or quite as long as the tube. Corolla pubescent like those of *W. longifolia* and *W. glabra*.—Benth. in DC. *Prod.* xii. 571; Hook. f. *Fl. Tasm.* i. 285.

**Tasmania.** Derwent river, *R. Brown*; abundant throughout the colony, ascending to 3000 feet, *J. D. Hooker*.

**Var. ? *subsericea*.** Upper leaves and inflorescence silky-pubescent. Leaves thick, not at all revolute, 3 to 4 lines long. Corolla nearly glabrous, the lobes apparently narrower than in the typical form.—Head of the Douglas river, *Milligan*.

This variety in some measure connects *W. rubiæfolia* through *W. brevifolia* with *W. rosmariniformis*, whilst, if the number of leaves in the whorl be neglected, *W. rubiæfolia* passes through *W. glabra* and *W. longifolia* into *W. eremicola* and *W. senifolia*,

leaving only *W. rigida* and *W. Dampieri* to be distinguished by the shortness of the calyx-teeth.

TRIBE VI. AJUGOIDEÆ.—Stamens 4, in pairs, exserted from the very short truncate or deeply slit upper lip of the corolla (except very rarely in genera not Australian). Nuts prominently reticulate-rugose, not succulent, usually attached to near the middle. Seeds without albumen.

Some genera of this tribe approach very nearly to *Vitex* and its allies in Verbenacæ.

## 20. TEUCRIUM, Linn.

Calyx-teeth 5, equal or the upper one more frequently larger than the others. Corolla-tube short, the 4 upper lobes nearly equal or the 2 uppermost larger, all 4 lateral, erect or declinate, the middle lower lobe larger, obovate or oblong, spreading and usually concave. Stamens 4, in pairs, exserted from between the upper corolla-lobes and arched over the corolla. Anthers reniform, 1-celled by confluence of the cells. Style shortly bifid at the end. Nuts laterally attached to near or to above the middle, reticulate-rugose or rarely nearly smooth.—Herbs undershrubs or shrubs, showing considerable diversity in habit and inflorescence. Leaves entire, toothed or variously divided.

The genus is widely distributed over the temperate regions of the globe, chiefly in the northern hemisphere, with a few tropical chiefly mountain species. The Australian species are all endemic, although in some measure allied, in some instances to S. African, in others to Himalayan or European species.

Peduncles longer than the calyx, 1- or more-flowered.

Plant hoary or white, rigid. Leaves mostly entire. Peduncles rigid, all 1-flowered . . . . . 1. *T. racemosum*.

Plant green, nearly glabrous. Leaves mostly entire. Peduncles slender, all 1-flowered or the lower ones 3- or 5-flowered . . . . . 2. *T. integrifolium*.

Plant green, pubescent or villous. Leaves toothed or cut or the upper ones entire. Peduncles slender, 3- or more flowered . . . . . 3. *T. corymbosum*.

Flowers sessile or nearly so.

Flowers all axillary. Leaves narrow, 3-lobed. Corolla two upper lobes twice as large as the next pair . . . . . 4. *T. fililobum*.

Flowers in more or less leafy spikes. Leaves mostly 3- or 5-lobed. Corolla lateral lobes as large as the upper pair . . . . . 5. *T. sessiliflorum*.

Flowers in terminal spikes. Leaves toothed or rarely lobed. Corolla with all 4 upper lobes small and distant . . . . . 6. *T. argutum*.

1. ***T. racemosum***, *R. Br. Prod.* 504. A perennial or undershrub with a woody rootstock and erect rigid more or less branched stems, from 6 in. to above 1 ft. high, hoary or white as well as the foliage and inflorescence, with a close minute tomentum scarcely wearing off from the upper surface of the older leaves. Stem-leaves linear-lanceolate or oblong-linear, obtuse, entire or very rarely 3-lobed, contracted into a short petiole, from under  $\frac{1}{2}$  in. to above 1 in. long, the margins sometimes recurved and occasionally undulate-crisped; the lower leaves in some specimens 3 together on each side of the stem; the upper and floral ones gradually smaller, more sessile, broader at the base, the





slender, shorter or longer than the leaves, bearing a loose cyme of 3 to 7 or rarely more flowers, usually rather smaller than in *T. racemosum*, but sometimes at least as large, otherwise the same as in that species, the calyx-teeth nearly equal and as long as or longer than the tube, the 4 upper lobes of the corolla nearly equal and oblong, the middle lower one twice as long. Nuts pubescent.—Benth. in DC. Prod. xii. 577, Hook. f. Fl. Tasm. i. 285; *Scoparia australis*, Sieb. in Schult. Syst. iii. Mant. 66; *Anisomeles australis*, Spreng. Syst. Cur. Post. 226.

**N. S. Wales.** Port Jackson to the Blue Mountains, *R. Brown*, *Sieber*, n. 184, and others; northward to Clarence and Hastings rivers, *Beckler*; New England, *C. Stuart*.

**Victoria.** Yarra-Yarra, *Robertson*; Latrobe, Avon, Snowy and Macalister rivers, *F. Mueller*.

**Tasmania.** Not uncommon in dry places in various parts of the colony, *J. D. Hooker*.

**S. Australia.** Beds of creeks and rocky hills, Wulpena, Barula, Crystal Brook, *F. Mueller*; Lake Gillies, *Burkitt*; Mount Searle, *Warburton*.

Var. ? *hirsutum*. The whole plant viscid and hirsute with rather long spreading hairs. Leaves rather large, contracted into a very short petiole or quite sessile. Cymes loose, several flowered. Perhaps a distinct species.

**Queensland.** Mountain tops near Rockhampton, *Bowman*, *O'Shanesy*; Liverpool Range, *Leichhardt*.

*T. lanceolatum*, Benth. Lab. Gen. et Sp. 666 and in DC. Prod. xii. 576, from Bathurst, *A. Cunningham*, is founded on luxuriant flowering branches of *T. corymbosum*, of which the lower leaves are wanting and the upper ones are all lanceolate and entire, or slightly toothed.

*T. petrophilum*, *F. Muell.* in *Linnaea*, xxv. 426 from South Australia is founded on stout specimens of *T. corymbosum*, rather more hoary than usual.

4. ***T. fililobum***, *F. Muell. Herb.* Apparently shrubby, with diffuse or erect branched stems of 6 in. to 1 ft., pubescent with very short spreading hairs. Leaves rather crowded, deeply divided into 3 or rarely 5 narrow-linear lobes with revolute margins, the whole leaf rarely above  $\frac{1}{2}$  in. long, the floral ones similar. Flowers rather large, solitary in the axils, nearly sessile or on pedicels rarely exceeding 1 line. Calyx broadly campanulate, green, slightly pubescent, about 3 lines long, the teeth subulate-acuminate or very acute, as long as the tube. Corolla pubescent outside, the 2 upper lobes broad and very obtuse, the 2 lateral ones much smaller, the middle lower lobe again larger. Nuts glabrous or scarcely pubescent.

**W. Australia.** *Drummond*, n. 65, 2nd coll. n. 213, 4th coll. n. 169; Puttingup, *Maxwell*.

*Drummond's* specimens, n. 65, were referred by *De Vriese* (*Goodenoviæ*, p. 183) to *Leschenaultia tubiflora*, and so named by him in *Herb. Hooker*.

5. ***T. sessiliflorum***, *Benth. in DC. Prod.* xii. 580. A perennial, with ascending or erect slightly branched stems under 6 in. high, glabrous or slightly pubescent as well as the foliage, the inflorescence usually hirsute. Leaves oblong-cuneate or linear-cuneate, 3- or 5-lobed, the lobes either short and broad or long and linear, the margins usually recurved and the primary veins prominent underneath, usually contracted into a broad petiole and varying in length from  $\frac{1}{2}$  in. to above





1 in., the floral ones short, broad and sessile, distant or close and imbricate, usually toothed only at the end. Flowers small, in dense or interrupted terminal leafy spikes, each one solitary in the axil of the floral leaf and sessile. Calyx hirsute, about 2 lines long, the teeth equal short and broad. Corolla lobes only shortly exceeding the calyx. —*T. trifidum*, Schlecht. *Linnaea*, xx. 609, not of Retz.

**Victoria.** Murray river, *F. Mueller*; Wimmera, *Dallachy*.

**S. Australia,** *Behr.*; Rocky Creek and head of Spencer's Gulf, *F. Mueller*; Venus Bay, *Warburton*.

**W. Australia,** *Drummond*, 2nd coll. n. 211.

6. **T. argutum**, *R. Br. Prod.* 504. A perennial, with erect simple or slightly branched stems of 6 in. to 1 ft., the whole plant pubescent or hirsute but green. Leaves on rather slender petioles, ovate-lanceolate or ovate, sometimes hastate, regularly serrate or crenate, or rarely less regularly toothed or lobed, more or less rugose, mostly from  $\frac{3}{4}$  to  $1\frac{1}{2}$  in. long, the floral ones reduced to small lanceolate or rarely ovate persistent bracts. Flowers not very constantly opposite, sessile or shortly pedicellate, in loose or dense terminal spikes. Calyx 2 to 3 lines long, the teeth acute, shorter than the tube, the upper ones especially the uppermost one rather broad, the 2 lowest narrow. Corolla with the 4 upper (lateral) lobes very small acute and distant, the middle lower lobe much larger and obovate. Nuts glabrous.—*Benth.* in *DC. Prod.* xii. 584.

**Queensland.** Gilbert river, *F. Mueller*; Port Denison, *Fitzalan*, *Dallachy*; Rockingham Bay, *Dallachy*; Rockhampton, *O'Shanesy*, *Dallachy*; Nerook Creek and Bowen river, *Bowman*; Moreton Bay, *Backhouse*; near Mount Owen, *Mitchell*.

**N. S. Wales.** Hawkesbury river, *R. Brown*; Nepean river, *Woolfs*; Tweed and Richmond rivers, *C. Moore*; New England, *C. Stuart*; McLeay and Clarence rivers, *Beckler* (the latter with smaller leaves and flowers).

Var. *incisa*. Leaves small, mostly lobed.—Dawson river, *F. Mueller*; Darling Downs, *Lau*; Armadilla, *Barton*.

## 21. AJUGA, Linn.

Calyx-teeth 5, equal. Corolla-tube short or long, the upper lip very short, truncate or emarginate, the lower lip long and spreading, the lateral lobes oblong, small, the middle lobe much larger, emarginate or bifid. Stamens 4, in pairs, exserted from the upper lip and arched over the corolla; anthers reniform, 1-celled by the confluence of the cells. Style shortly bifid at the end. Nuts laterally attached to near or above the middle, reticulate-rugose.—Herbs, usually diffuse or ascending or with spreading radical leaves and shortly erect stems. Flowers in false-whorls in the axils of floral leaves gradually smaller than the stem-leaves, the upper ones sometimes forming terminal leafy spikes. Bracts linear, or very small or none.

The genus is widely dispersed over the extratropical regions of the Old World, and chiefly in the mountain districts within the tropics, but wanting in America. The two Australian species, as usually defined, are endemic, one of them however scarcely to be distinguished from a common northern one.

Floral leaves entire or with very few coarse teeth, and smaller or narrower than the flowerless ones. Flowers 5 lines to 1 in. long . 1. *A. australis*.  
 Floral leaves like the stem ones, ovate, deeply sinuate-toothed and rugose. Flowers not exceeding 3 lines . . . . . 2. *A. sinuata*.

1. ***A. australis***, *R. Br. Prod.* 503. A perennial, more or less pubescent or villous, without stolones, with erect or ascending simple stems from 2 or 3 in. to above 1 ft. long, flowering nearly from the base. Leaves chiefly radical, obovate or oblong, coarsely toothed, contracted into a long petiole, often 3 to 4 in. and sometimes still longer; lower floral leaves nearly similar or smaller and narrower, passing into sessile oblong or lanceolate entire ones, all longer than the flowers or the upper ones very small. Flowers blue, nearly sessile, in false whorls of from about 6 to above 20, exceedingly variable in size. Bracts linear, the outer ones sometimes as long as the calyx, the inner ones or nearly all very small or obsolete. Calyx villous or nearly glabrous, from about 2 lines to nearly 4 lines long, the teeth acute, shorter than the tube. Corolla-tube from the length of the calyx to twice as long, always with a transverse ring of hairs inside above the ovary, the upper lip truncate or emarginate, sometimes exceedingly short, in some of the larger flowers nearly 1 line long, but always twice as broad as long, and never longer than the space between the base of the lower lip and the lateral lobes; the middle lobe of the lower lip usually longer than the tube. Nuts glabrous.—Benth. in DC. *Prod.* xii. 597; Hook. f. *Fl. Tasm.* i. 286; *A. diemenica*, Benth. *Lab. Gen. et Sp.* 695 and in DC. *Prod.* xii. 597; *A. virgata* and *A. tridentata*, Benth. *Lab. Gen. et Sp.* 700, 701; and in DC. *Prod.* xii. 601, 602.

**Queensland.** Keppel Bay, *R. Brown*; Percy isles, *A. Cunningham*; Port Curtis, *M. Gillivray*; Rockingham Bay and Rockhampton, *Dallachy* and others; Moreton Bay, *C. Stuart*; Mount Faraday, *Mitchell*.

**N. S. Wales.** Port Jackson to the Blue Mountains, *R. Brown* and others; Lachlan river, *A. Cunningham*; from thence and the Darling to the Barrier Range, *Victorian and other Expeditions*; New England, *C. Stuart*; Hastings, Macleay and Clarence rivers, *Beckler* and others.

**Victoria.** Near Melbourne, *Adamson*; Yarra, Broken and Murray rivers, *F. Mueller*; Wimmera, *Dallachy*; mouth of the Glenelg, *Allitt*; Ballarook Forest, Creswick, *Whan*.

**Tasmania.** Common in damp meadows, &c. throughout the colony, *J. D. Hooker*.

**S. Australia.** From the Murray to St. Vincent's Gulf, *F. Mueller* and others; Mount Searle, *Warburton*; Kangaroo island, *Waterhouse*.

The characters on which I had formerly, from the examination of few and some of them very imperfect specimens, distinguished four species distributed into two sections, have entirely broken down by the comparison of the numerous specimens now before me, comprised in above eighty sheets, from a great variety of stations, and all must evidently be referred to a single species, not separable from the northern *A. genevensis* by any marked characters, but differing chiefly in the greater development of the floral leaves, which are narrower more herbaceous and less toothed than in *A. genevensis*, and never broad and imbricate as in *A. pyramidalis*. In some of the Australian varieties the flowerless leaves are almost entirely radical, large and on long petioles, and the floral leaves lanceolate or oblong, scarcely toothed and not twice as long as the flowers; in others there are a few flowerless leaves at the base of the stems forming a gradual passage from the radical to the floral ones which are all several times as long as the flowers. Then as to size and indumentum, some specimens from the











interior of N. S. Wales and from S. Australia are very hoary-villous all over, with radical leaves 6 in. long and robust stems of above 1 ft., the flowers themselves nearly 1 in. long; others both from the North and the South have the flowers scarcely 5 lines long, the common size being between these two extremes, with every degree of villosity from almost glabrous in some Tasmanian ones to the above-mentioned exceedingly villous ones. The very indifferent specimen which I had published as *A. virgata* appears to be a long drawn-up flowering stem of an old plant not otherwise differing from a form which now proves to be frequent. *A. tridentata*, with a similar habit but still more drawn out and less villous, has all the floral leaves broadly sessile, ovate and deeply 3-toothed or 3-lobed, which give a very different aspect to the plant, but these characters are not as yet confirmed by any more perfect specimens.

2. *A. sinuata*, R. Br. *Prod.* 503. A low diffuse much-branched hirsute perennial, not exceeding 6 in. Leaves ovate or oblong, deeply and irregularly sinuate-toothed, the radical ones on rather long petioles, 1 to 3 in. long, the floral ones on shorter petioles,  $\frac{1}{2}$  to  $\frac{3}{4}$  in. long, but all rugose and prominently and obtusely toothed like the radical ones. Flowers not 3 lines long, about 6 in the whorl. Calyx hirsute. Corolla upper lip not exceeding the calyx-teeth.—Benth. in DC. *Prod.* xii. 598.

**N. S. Wales.** Hunter's river, R. Brown; Macleay river, *Herb. F. Mueller*.

The species is nearer to the Himalayan *A. parviflora* than to any other, the habit the floral leaves and the very small flowers prevent its union with *A. australis*, unless the whole of the section *Bugula* from Europe, Asia, Africa and Australia, with the exception of *A. lobata*, *A. reptans*, and *A. orientalis*, be joined together under the Linnean name of *A. genevensis*.

## ORDER XCIV. PLANTAGINEÆ.

Flowers regular. Sepals 4. Corolla small, scarious, with an ovate or cylindrical tube and 4 spreading lobes, imbricate in the bud. Stamens 4, or rarely fewer, inserted in the tube of the corolla and alternate with its lobes, usually long; anthers 2-celled, the cells parallel, opening longitudinally. Ovary free, 1-2- or 4-celled, with one or more ovules in each cell. Style simple, terminal, entire, with 2 opposite longitudinal stigmatic lines. Capsule opening transversely or indehiscent. Seeds peltate, laterally attached, albuminous. Embryo straight or slightly curved, parallel to the hilum.—Herbs with radical tufted or spreading leaves, rarely branched and leafy. Flowers in heads or spikes or rarely solitary, on leafless axillary peduncles, each one sessile within a small bract.

A small Order, widely spread over the globe, but chiefly in the temperate regions of the Old World. The only Australian genus is the principal one of the Order, which, besides that one, only contains two others, both monotypic, one from the mountains of S. America, the other European and aquatic, both of them very anomalous.

### 1. PLANTAGO, Linn.

Flowers hermaphrodite, in heads or spikes. Stamens 4. Capsule 2- or 4-celled; the other characters those of the Order.

The geographical range of the genus is the same as that of the Order. Among the Australian ones, besides those that are introduced, one extends to New Zealand and

the Antarctic islands, and possibly to the extratropical mountains of South America; the others, as far as hitherto ascertained, are all endemic, but the discrimination of some of the very variable species of the genus is as yet very far from being satisfactorily carried out. The characters derived from the exerted or included styles or stamens have been shown by A. Gray to be dimorphic or subsexual and not specific, and there remains often little to be relied upon but the shape of the leaves, the density of inflorescence, the size of the flowers and similar eminently variable differences.

- Ovary 2-celled with 1 ovule in each cell. Flowers in very dense ovate or broadly oblong spikes or heads . . . . . 1. *P. lanceolata*.  
 Ovary apparently 4-celled, with 1 ovule in each cell (2-celled, with 2 ovules in each cell separated by spurious dissepiments). Flowers closely appressed in narrow cylindrical spikes . . . . . 2. *P. coronopus*.  
 Ovary 2-celled, with 2 ovules in each cell without spurious dissepiments.  
 Spikes very slender, interrupted. Flowers small. Leaves usually rather broad. Calyx not exceeding  $\frac{3}{4}$  line . . . . . 3. *P. debilis*.  
 Spikes rigid, not very close, above 1 in. long (excepting depauperated specimens with few flowers). Leaves usually narrow. Calyx 1 to  $1\frac{1}{4}$  lines long . . . . . 4. *P. varia*.  
 Spikes dense, cylindrical,  $\frac{1}{2}$  to 1 in. long, the buds closely imbricate. Leaves rather broad, villous on both sides . . . . . 5. *P. antarctica*.  
 Spikes dense, ovoid-oblong or cylindrical, under  $\frac{3}{4}$  in. long. Leaves usually broad and rather thick. Flowers glabrous. Corolla-lobes narrow . . . . . 6. *P. tasmanica*.  
 Ovary 2-celled, with 2 superposed pairs of ovules in each cell. Dwarf alpine plants with thick leaves, the flowers in heads of 2 to 6 or solitary.  
 Leaves  $\frac{1}{2}$  to  $1\frac{1}{2}$  in. long, rosulate on a short thick stock . . . . . 7. *P. Brownii*.  
 Leaves not above  $\frac{1}{2}$  in. long, the fresh ones rosulate at the ends of the slender branches of a densely tufted stock covered with the remains of old leaves . . . . . 8. *P. Gunnii*.

Besides the above, *P. major*, Linn.; Dene. in DC. Prod. xiii. i. 694, a common European weed, with broadly-ovate large leaves, long cylindrical spikes, and the ovary 2-celled, with usually more than 2 superposed pairs of ovules in each cell, has established itself between Bridgewater and New Norfolk in Tasmania (*Herb. F. Mueller*).

1. ***P. lanceolata*, Linn.; Dene. in DC. Prod. xiii. i. 714.** Stock usually more or less woolly or silky-hairy. Leaves radical, lanceolate or oblong-lanceolate, acute, entire or minutely and obscurely toothed, contracted at the base, more or less hairy or glabrous. Scapes long. Flowers in a close dense ovate spike or head, often becoming oblong when old. Lower sepals usually united almost to the top. Ovary 2-celled with only one ovule in each cell.

Very common in Europe and temperate Asia and now established in many parts of **Victoria and Tasmania**.

Var. *erriophylla*, Dene. l.c. 715. Leaves and sometimes the inflorescence more or less densely covered with long silky-woolly hairs.

**Victoria.** Yarra-Yarra and Forest Creek, *F. Mueller*; heath ground near Portland, *Barclay*.

2. ***P. coronopus*, Linn.; Dene. in DC. Prod. xiii. i. 732.** Plant more or less hirsute. Leaves radical, linear, acute, entire or pinnatifid with linear lobes, which are themselves sometimes deeply toothed or pinnatifid. Scapes usually under 6 in. long. Spikes dense and cylindrical but narrow,  $\frac{1}{2}$  to 2 in. long, the flowers closely imbricate when





dry, the 2 upper sepals with prominent scarious usually ciliate keels or wings. Ovary apparently 4-celled with one ovule in each cell, but really 2-celled only, with a spurious dissepiment between the two collateral ovules reaching to but not cohering with the wall of the cell, the capsule often only 1- or 2-seeded by abortion.

**Victoria.** Portland, *Allitt*.

**Tasmania.** Roadsides, George Town, Perth, &c., *Gunn* and others.

**S. Australia.** Holdfast Bay, *F. Mueller*.

**W. Australia.** Swan river, *Drummond*, n. 225.

Very common in temperate regions of the northern hemisphere in the Old World, especially in maritime or in sandy districts, and thence probably introduced into Australia.

3. ***P. debilis***, *R. Br. Prod.* 425. Very near *P. varia*, and according to *F. Mueller* only a variety of that species. Stock without any or with only a few long woolly hairs between the leaves, the foliage and inflorescence hirsute or nearly glabrous. Leaves radical, oblong or lanceolate, entire or toothed, usually broader and shorter than in *P. varia*. Scapes very slender, from 2 or 3 in. to 1 ft. high, the flowers all distant when fully out, and much smaller than in *P. varia*, forming a slender interrupted spike often occupying above half the scape. Calyx not exceeding  $\frac{3}{4}$  line when in fruit and still smaller at the time of flowering, the opaque centre of the sepals with a few appressed hairs or more frequently glabrous. Ovary 2-celled, with 2 collateral ovules in each cell. Capsule with 4 or fewer seeds.—*Dene*, in *DC. Prod.* xiii. i. 701.

**Queensland.** Brisbane river, Moreton Bay, *F. Mueller*, *C. Stuart*; Armadilla, *Barton*.

**N. S. Wales.** Blue Mountains, *R. Brown*, *Woolfs*; New England, *C. Stuart*; Hastings, Clarence, and Macleay rivers, *Beckler*.

**Victoria.** Taralgin Creek and Hobson's Creek, *F. Mueller*.

*P. Cunninghamii*, *Dene*, in *DC. Prod.* xiii. i. 702, from a single leaf preserved in the Hookerian herbarium, is probably this species; *Cunningham's* original specimen appears to have remained in the herbarium of the Paris Museum.

4. ***P. varia***, *R. Br. Prod.* 424. A perennial often flowering the first year so as to appear annual, but forming ultimately a thick stock with the membranous dilated imbricate bases of the leaves enveloped in long reddish brown woolly or silky hairs sometimes very copious, in other specimens very few or scarcely any. Leaves all radical, erect or rosulate, usually lanceolate or linear-lanceolate, entire or bordered by a few teeth, with 1, 3 or 5 nerves prominent underneath, contracted into a long petiole, more or less hirsute, the whole leaf under 2 in. in some specimens, 6 in. to 1 ft. long in others and varying occasionally but rarely to ovate-lanceolate, more frequently to linear. Scapes longer than the leaves, bearing in the upper portion a rather dense or more or less interrupted spike from 1 to 3 or 4 in. long, more or less hirsute, with short or long hairs more appressed than on the leaves; in starved specimens grown in very dry places, the spikes are sometimes reduced to very few or even only 2 or 3 flowers clustered at the end of a short scape. Calyx sessile within a bract rather shorter and narrower

than the sepals and not at all or very narrowly scarious on the margins. Sepals all free,  $1\frac{1}{4}$  to  $1\frac{1}{2}$  lines long, obtuse with broad scarious margins, the centre opaque, from copiously hirsute to quite glabrous. Corollatube about as long as the calyx, lobes ovate, usually broad, acute or almost obtuse, much imbricate in the bud, one entirely outside and the opposite one entirely inside. Ovary 2-celled with 2 collateral ovules in each cell. Capsule shortly conical at the top or obtuse, circumscribed, ripening all four seeds or sometimes only one or two of them.—Dene. in DC. Prod. xiii. i. 701; Nees in Pl. Preiss. i. 490; Hook. f. Fl. Tasm. i. 302; *P. debilis*, Nees in Pl. Preiss. i. 491, not of R. Br.

**Queensland.** In the interior, *Mitchell*.

**N. S. Wales.** Chiefly in the interior, Morley's plains, *A. Cunningham*; Darling river, *Woolfs*; Lachlan and Darling rivers to the Barrier Range, *Victorian and other Expeditions*; northward to Clarence river and Mount Mitchell, *Beckler*; New England, *C. Stuart*.

**Victoria.** Port Phillip, *R. Brown*; Wendu Vale, *Robertson*; near Melbourne, *Adamson*; thence to the Avoca, Murray, and Ovens rivers, *F. Mueller*; Wimmeru, *Dalbachy*.

**Tasmania.** Port Dalrymple and Derwent river, *R. Brown*; abundant everywhere in the colony, *J. D. Hooker*.

**S. Australia.** Murray river to St. Vincent's and Spencer's Gulfs, *F. Mueller* and others; in the interior to Cooper's Creek, *Wheeler*; Kangaroo island, *Waterhouse*.

**W. Australia.** King George's Sound to Swan river, *Drummond*, n. 224, 393, 714, 738, *Preiss*, n. 1968, 1970, *Oldfield* and others; Murchison river, *Oldfield*.

The variations of this polymorphous species are so complicated that I have been unable to assign them any definite limits as to characters or to geographical range, and it would appear that no less than ten of the supposed species enumerated by Decaisne should be included in it, the characters derived from supposed duration, from minutie in the form and hairiness of the sepals and bracts, and from the breadth and acuteness of the corolla-lobes having entirely broken down. The typical *P. varia* has the woolly hairs at the base of the leaves copious, the sepals not very obtuse and hispid on the opaque centre and extends over the whole range of the species. It would include Nees's *P. debilis* or *P. exilis*, Dene. in DC. Prod. xiii. i. 702, *P. runcinata*, Dene. l.c. 702 and *P. consanguinea* Dene. l.c. 703.

*P. hispida* of most authors, but scarcely of Brown, has the long hairs or so-called beard at the base of the leaves few or none, the sepals broad and obtuse, quite glabrous or slightly hispid on the opaque centre. It is also found at almost all the habitats of the typical form and would include *P. Mitchellii* and *P. Drummondii*, Dene. l.c. 701, and also, from the character given, *P. Gaudichaudii*, Barn. Monogr. Plantag. 15; Dene. l.c. 702.

*P. struthionis*, A. Cunn.; Dene. l.c. 702, and *P. sericophylla*, Dene. l.c. 702, both founded on indifferent N. S. Wales specimens of Cunningham's, appear to be luxuriant states of the species, with the glabrous or slightly hispid sepals of the preceding form, but with rather more woolly hair at the base of the leaves and the leaves and scapes drawn out to nearly 1 ft. in length, the leaves of *P. struthionis* being rather broader than in *P. sericophylla*.

Starved specimens of both the above principal forms occur, especially in Victorian and Tasmanian collections, with the spikes reduced to very few flowers almost collected into heads, but not so compact as in *P. tasmanica* and usually with the appearance of annuals. It is probably to one of these that belongs the *P. bellidioides*, Dene. l.c. 701, described from a Tasmanian specimen of Gunn's, but which I have not precisely identified.

*P. hispida*, R. Br. Prod. 425, from the seacoast, Port Dalrymple, is a small very hispid form with the narrow hispid calyxes of the typical form but with rather smaller flowers and without the long woolly hairs at the base of the leaves. It passes into the following:—

Var. ? *parviflora*. Smaller in all its parts than *P. varia*, but otherwise closely resembling the typical form with narrow leaves and hirsute flowers. Spikes cylindrical, rather dense or loose,  $\frac{1}{2}$  to 1 in. long or rather more. Sepals rather above 1 line long, the opaque centre usually hirsute. Capsule with a conical end exceeding the calyx and longer than in other varieties of this species.—N. S. Wales and more frequently in Victoria, also Kangaroo island. *R. Brown*.—Perhaps a distinct species and in some measure connecting *P. varia* with *P. debilis*.

It is very possible that the study of the different forms thus included in *P. varia* on the living plants by local botanists, who would bestow on them the time and patience that has been devoted to European *Rubi*, *Batrachian Ranunculi*, &c., might point out several permanent races, of which dried specimens without indication of the circumstances of their growth give no indication.

5. ***P. antarctica***, *Dene. in DC. Prod. xiii. i. 703 ? Hook. f. Fl. Tasm. i. 303*. Stock usually woolly-hairy at the base of the leaves. Leaves radical, broadly lanceolate or ovate-lanceolate, acute, entire, with broad petioles, villous on both sides like the villous specimens of *P. tasmanica*, but usually larger. Spikes dense and cylindrical although narrower than in *P. tasmanica*,  $\frac{1}{2}$  to above 1 in. long; the buds very closely imbricate in several rows. Bracts and sepals quite glabrous or rarely with a few marginal cilia.

**Victoria.** Cobra mountains, *F. Mueller* (rather doubtful).

**Tasmania.** Marshes of St. Patrick's river, *Gunn*; South Esk river, *C. Stuart*.

I have seen but very few specimens, and with J. D. Hooker do not feel certain of their correct identification with Verreaux's Tasmanian plant described by Decaisne. The flowers are smaller and the spikes more dense than in *P. varia*, the foliage is nearer that of *P. tasmanica*, and it appears to differ from both in the close imbrication of the buds before expanding.

6. ***P. tasmanica***, *Hook. f. in Hook. Lond. Journ. vi. 276, and Fl. Tasm. i. 303*. A small alpine species. Leaves radical, rosulate, oblong or oblong-lanceolate or sometimes almost obovate, more rarely narrow-lanceolate, contracted into a short petiole, entire or rarely coarsely toothed, usually of a thick consistence, from densely hoary-hirsute on both sides to quite glabrous. Scapes short, rarely attaining 6 in., with a dense ovoid oblong or cylindrical spike, rarely  $\frac{3}{4}$  in. long, and sometimes reduced to 2 or 3 flowers, glabrous or intermixed with a few hairs. Sepals glabrous, about 1 line long, with less of the scarious margin than in *P. varia*. Corolla-lobes narrower than in that species and more acute. Ovary 2-celled with two collateral ovules in each cell.—*Dene. in DC. Prod. xiii. i. 703*; *P. glabrata*, *Hook. f. in Hook. Lond. Journ. vi. 276, Dene. l.c. 703*; *P. leptostachys*, *Hook. f. l.c. (P. Daltoni, Dene. l.c.)*

**Victoria.** Mungyong mountains, sources of the Yarra, Baw-baw mountains, *F. Mueller*.

**Tasmania.** Abundant in wet marshy places on the mountains at an elevation of 3000 to 4000 ft., *J. D. Hooker, Gunn, Miligan* and others.

*P. Archeri*, *Hook. f. Fl. Tasm. i. 303*, from the Western mountains, Tasmania, *Archer*, and from the summit of Mount Wellington, *F. Mueller*, seems to be a small state of the same species with more obovate leaves. *F. Mueller* thinks that *P. tasmanica* itself is only an alpine form of *P. varia*.

7. ***P. Brownii***, *Rapin in Mem. Soc. Linn. Par. vi. 484*. A small plant, with a densely tufted stock, woolly amongst the leaves or quite glabrous. Leaves radical, rosulate, thick, somewhat fleshy, and of a



bright shining green when fresh, oblong-lanceolate or spatulate, entire or with a few teeth, quite glabrous. Scapes sometimes scarcely any, often shorter than the leaves but sometimes longer, glabrous as well as the flowers. Flowers only 2 to 4 rarely as many as 6 in small terminal spikes or heads, and sometimes reduced to a single one, each flower about the size of those of *P. varia*. Sepals obtuse, without much of the scarious margin,  $1\frac{1}{4}$  lines long or rather more. Corolla-lobes usually rather narrow. Ovary 2-celled with 2 superposed pairs of ovules in each cell, but often few of them only ripening into seeds.—Dene. in DC. Prod. xiii. i. 727; Hook. f. Fl. Tasm. i. 304; *P. carnosa*, R. Br. Prod. 425; not of Lam.; *P. stellaris*, F. Muell. Fragm. ii. 23, Pl. Vict. ii. t. 66.

**Victoria.** Summits of the Manuyong Mountains, *F. Mueller*.

**Tasmania.** Port de l'Esperance, *R. Brown*; South Cape, *Gunn*; South Port, *C. Stuart*; Macquarrie Harbour, *Milligan*.

The species is also in New Zealand and in the Auckland islands, and may be the same as one or more of the antarctic American ones referred to the same section by Decaisne.

*P. paradoxa*, Hook. f. in Hook. Lond. Journ. vi. 277 and Fl. Tasm. i. 304, from Lake St. Clair, *Gunn*, Mersey river, *Archer*, Kernandee river, *Oldfield*, Mount Lapeyrouse, *C. Stuart*, seems to me to be a small state of *P. Brownii* reduced to 1 or 2 flowers on the scape as in *P. Gunnii*, but with the foliage and stock of the small specimens of *P. Brownii*. The specimens before me from *C. Stuart*'s collection show a gradual series from the small 1-flowered to the largest 4- to 6-flowered states. *Brown*'s own specimens have mostly only 1 or 2 flowers.

8. ***P. Gunnii***, *Hook. f. in Hook. Lond. Journ. v. 446, t. 13, and Fl. Tasm. i. 304*. A small densely tufted almost moss-like plant, the stems closely packed but slender, branching and growing to 1 in. or more, covered with thin persistent remains of old leaves and ending in a spreading tuft of fresh ones. Leaves from narrow ovate-oblong to linear-lanceolate, acute or obtuse, contracted into a short petiole, rather thick, with ciliate margins and sometimes a few hairs on the upper surface, otherwise glabrous and smooth, rarely exceeding 3 lines. Peduncles shortly exceeding the leaves, more or less hairy, bearing 1 or rarely 2 small flowers. Sepals glabrous. Ovary 2-celled with 2 superposed pairs of ovules in each cell, but usually only one appears to ripen.—Dene. in DC. Prod. xiii. i. 728.

**Tasmania.** Loftiest parts of the Western Mountains, *Gunn*, *Archer*.

## ORDER XCV. PHYTOLACCÆÆ.

Perianth of 5 rarely 4 divisions or lobes, either all herbaceous, or scarious or petal-like on the margins or coloured inside, imbricate in the bud. Staminodia (or petals?) in a few genera not Australian 5 or fewer, minute and stipitate. Stamens as many as perianth-divisions and alternate with them or more numerous, inserted on the torus or at the base of the perianth; anthers 2-celled, the cells parallel, opening by longitudinal slits. Ovary either of a single somewhat ex-

centrical carpel, or of several carpels either distinct or united in a ring round the centre of the torus or, in a genus not Australian, forming a single 1-celled ovary with the ovules in a ring round a central column. Ovules solitary in each carpel, ascending, amphitropous or anatropous. Styles as many as carpels, proceeding from their upper inner angle, free or united at the base, stigmatic along their inner edge. Carpels of the fruit variously enlarged, free or united, dry or succulent, indehiscent or dehiscent along their inner or outer edge or both. Seed ascending, sometimes accompanied by a small arillus or strophiole; testa membranous or crustaceous. Albumen mealy or somewhat fleshy, copious, scanty, or sometimes none. Embryo usually much curved, rarely folded or straight; cotyledons narrow or broad and convolute; radicle inferior.—Herbs, undershrubs, or rarely shrubs or trees, usually glabrous. Leaves alternate, usually entire. Flowers hermaphrodite or unisexual, in terminal axillary or leaf-opposed spikes racemes or clusters, rarely solitary, usually accompanied by a subtending bract and 2 bracteoles.

The Order is chiefly American and African, a very few species extending into Asia, as weeds of cultivation or otherwise introduced. The Australian genera are all endemic, one of them nearly allied to, but quite distinct from, an American genus, the others belonging to a series (or genus in an extended sense) exclusively Australian. All have unisexual flowers, whilst those of the American and African genera are, with the exception of a single species, hermaphrodite.

Ovary of a single carpel. Fruit a burr with hooked bristles.

Flowers unisexual. Filaments filiform . . . . . 1. MONOCOCCUS.

Ovary of several carpels united in a ring. Fruit succulent. Flowers hermaphrodite . . . . . \* PHYTOLACCA.

Ovary of 2 or more carpels united round a central column. Flowers unisexual. Anthers sessile or nearly so.

Perianth deeply 4-lobed. Carpels 2. Flowers axillary . . . 2. DIDYMOTHECA.

Perianth sinuate-toothed. Carpels several.

Carpels 4 to 20, separating at their maturity, and opening at the outer edge or at both outer and inner edges. Flowers axillary . . . . . 3. GYROSTEMON.

Carpels from above 20 to 50, separating at their maturity and opening on the inner edge only. Flowers in spikes or racemes . . . . . 4. CODONOCARPUS.

Carpels about 20, connate in a globular almost woody indehiscent fruit. Male flowers in terminal spikes; females solitary and axillary . . . . . 5. TERSONIA.

The male plants in some species of each of the last four genera are undistinguishable from each other except by slight differences in the inflorescence.

The genus *Phytolacca*, marked above with an asterisk\* is American, but one species, *P. octandra*, Linn.; Moq. in DC. Prod. xiii. ii. 82, long since cultivated in various parts of the Old World, has established itself in some parts of N. S. Wales and Victoria near the towns. It is erect and herbaceous, attaining 6 to 10 ft. and not much branched, with large ovate-lanceolate acute leaves. Flowers hermaphrodite, almost sessile in pedunculate racemes, either terminal or almost leaf-opposed. Perianth small, of 5 divisions. Stamens usually 8. Carpels usually 8, united in the fruit in a depressed succulent almost black berry more or less prominently 8 ribbed. The flowers are occasionally 9- or 10-merous and then they only differ from *P. decandra*, Linn., which is more frequently cultivated in Southern Europe, in the sessile or exceedingly shortly pedicellate flowers.

## 1. **MONOCOCCUS**, F. Muell.

Flowers unisexual, monœcious or diœcious. Perianth of 4 distinct divisions. Stamens in the males 10 to 20, filaments filiform; anthers oblong-linear. Ovary in the females of a single carpel; style very short, hooked, and decurrent in a bearded line along the inner edge of the carpel. Fruit dry, indehiscent, covered with hooked bristles. Seed with a thin testa; albumen unilateral; embryo transversely folded, the cotyledons broad and convolute.—Shrub. Leaves membranous. Flowers in racemes either terminal or in the upper axils, the males usually in separate racemes or on separate individuals, but sometimes a few females at the base of the male racemes or a few males at the summit of the female racemes.

The single species known is endemic in Australia. It is in habit and most of the characters nearly allied to the American genus *Petiveria*, differing in the unisexual flowers, the more numerous stamens and the glochidiate bristles of the ovary and fruit numerous and spreading, instead of being 2 or 3 only and closely reflexed.

1. **M. echinophorus**, F. Muell. *Fragm.* i. 47. A straggling shrub, sometimes more erect and attaining 5 or 6 ft. Leaves petiolate, from ovate to lanceolate, obtusely acuminate, contracted at the base, membranous, 2 to 4 in. long. Racemes slender, often 5 or 6 in. long. Flowers rather distant, shortly pedicellate, each within a lanceolate acute bract shorter than the calyx and often shortly adnate to the base of the pedicel. Bracteoles 2, small, close under the perianth. Divisions of the perianth membranous, very thin, about 1 line long, obtuse. Filaments rather shorter than the anthers, often connate at the base in a short column when there is no rudiment of the ovary, rarely free round a rudimentary or imperfect ovary. Female flowers usually without stamina or staminodia. Ovary of a single oblique carpel, the straight inner (stigmatic?) edge densely bearded and terminating in a small hooked style, the back and sides of the carpel echinate with rigid hooked bristles. Fruiting carpel about 2 lines long without the long hooked bristles with which it is covered, forming an adhesive burr.

**Queensland.** Port Denison, *Fitzalan*; Edgecombe Bay, *Dallachy*; Broad Sound, *Bourman*; Rockhampton, *Thozet*, *O'Shanesy*; Brisbane river, Moreton Bay, *W. Hill*, *F. Mueller*.

**N. S. Wales.** Clarence river, *Beckler*; Richmond river, *C. Moore*.

## 2. **DIDYMOTHECA**, Hook. f.

Flowers diœcious. Perianth small, deeply 4-lobed. Stamens in the males about 8 or 9, the anthers oblong, nearly sessile, radiating in a single series round a flat central disk. Ovary in the females of 2 carpels adnate along the inner edge to a centre column, not at all or scarcely dilated at the top. Styles or stigmas linear, proceeding from the summit of the central column. Fruiting carpels scarcely separating from the

















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